

**California High-Speed Train Project**



**Request for Proposal  
for Design-Build Services**

**RFP No.: HSR 11-16  
Geotechnical Data Report  
Clinton Ave to East American Ave**

**Appendix B  
Exploratory Borehole Records**

## **Appendix B**

### **Exploratory Borehole Records**

**For gINT Database, see CD**



**Table B-1**  
Summary of Exploratory Borehole Locations, Depths, and In Situ Testing

Borehole ID	Elevation (NAVD88) (ft)	Northing (NAD83) (ft)	Easting (NAD83) (ft)	Continuous Sampling Interval(s) (ft)	Total Depth of Drilling (ft)	In Situ Testing	
						PS <sup>[1]</sup>	PZ <sup>[2]</sup>
S0001R	287.40	2,162,577	6,318,315	5 to 15.5	51.5		
S0002R	290.40	2,158,798	6,322,192	5 to 15.5	81.5		
S0003R	288.00	2,157,251	6,323,233	5 to 15.5	82.0		✓
S0004R	283.70	2,156,593	6,324,256	5 to 15.5; 50 to 56	81.5		
S0005R	285.30	2,155,457	6,325,239	5 to 15.5; 45 to 51	95.0	✓	✓
S0006R	287.60	2,154,688	6,325,497	5 to 15.5; 35 to 41	81.5		
S0007R	285.10	2,152,087	6,327,474	5 to 15.5	81.5		
S0010R	286.10	2,150,922	6,328,342	5 to 15.5	165.0	✓	✓
S0012R	287.60	2,148,215	6,330,774	5 to 15.5	165.0	✓	
S0013AR	286.10	2,146,714	6,332,312	5 to 15.5	150.0		✓
S0014AR	285.40	2,143,960	6,334,724	5 to 15.5	81.5		
S0014R	284.60	2,145,253	6,333,705	5 to 15.5	81.5		
S0015R	286.70	2,141,424	6,337,012	5 to 15.5	51.5		
S0016R	288.80	2,138,780	6,338,686	None	160.0		✓
S0017R	290.50	2,136,102	6,340,038	None	151.5		✓
S0018R	305.80	2,134,428	6,340,369	None	165.0	✓	✓
S0019R	292.50	2,125,499	6,341,566	5 to 15.5	51.5		
<sup>[1]</sup> PS: P- and s-wave suspension velocity logging							
<sup>[2]</sup> PZ: standpipe piezometer							



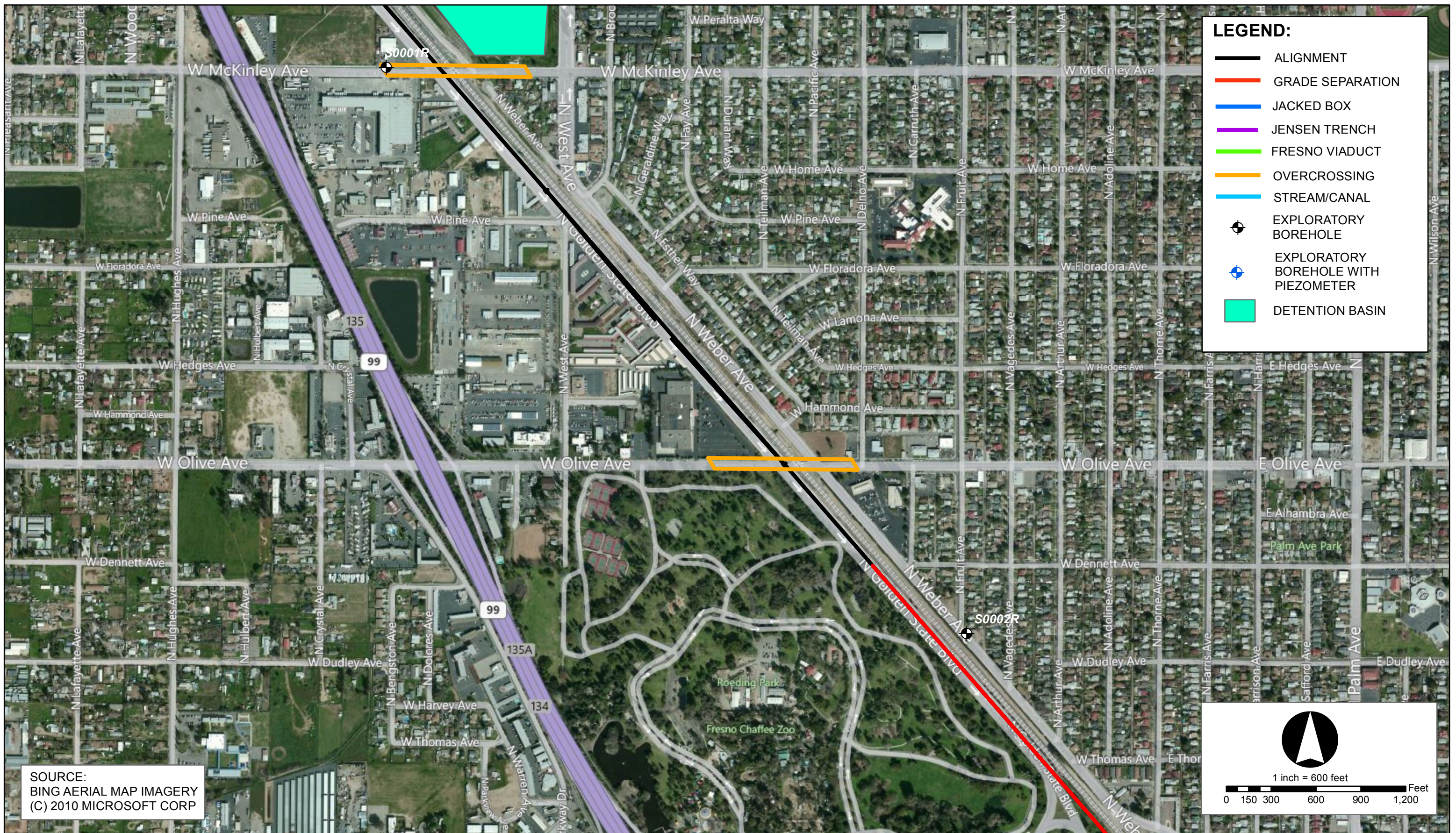


**EXPLORATORY BOREHOLE LOCATION INDEX SHEET**  
**California High Speed Train**  
**Fresno to Bakersfield**  
**Geotechnical Data Report - Package 1**

Figure No. B1  
 February 2012



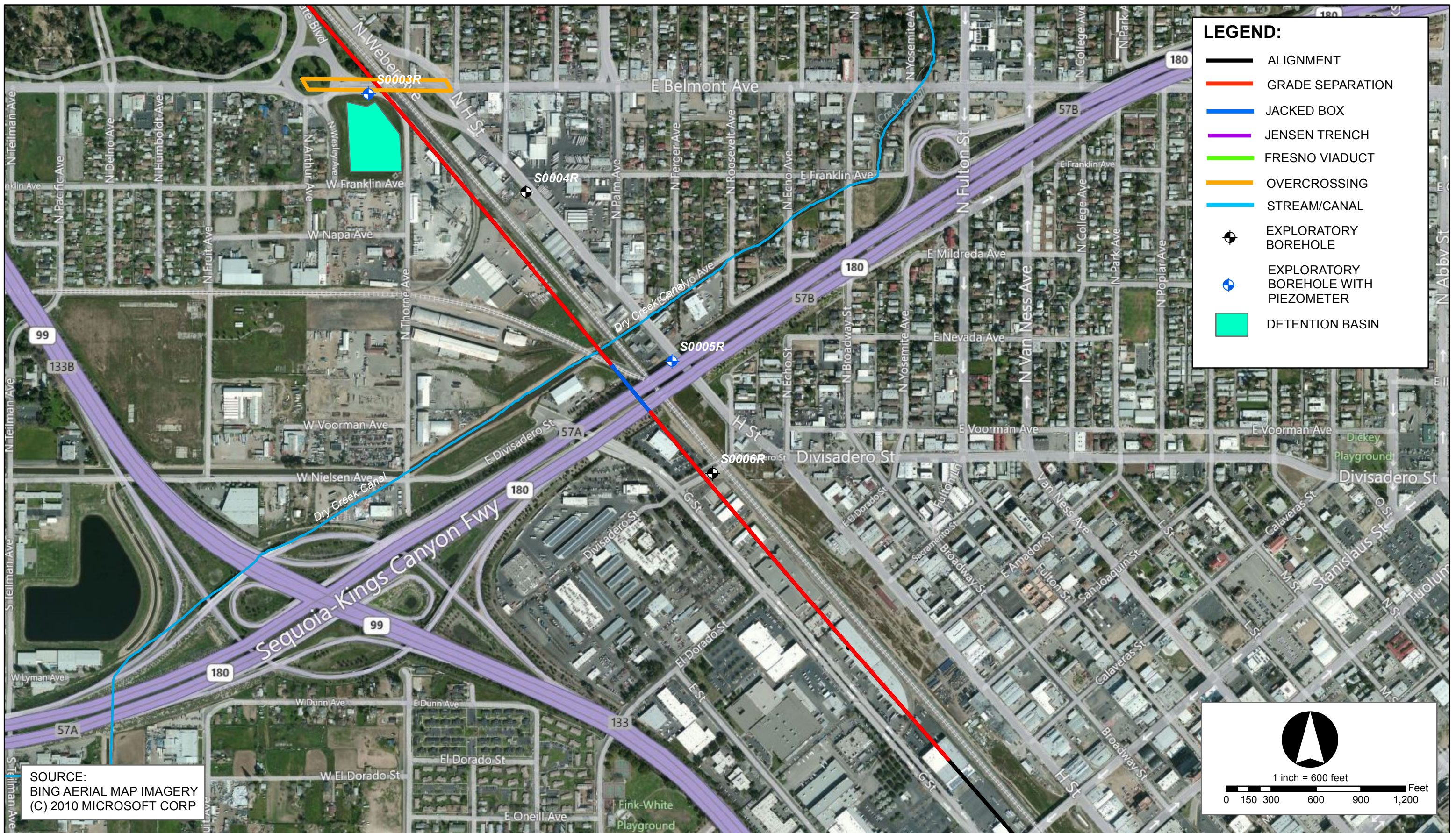




**EXPLORATORY BOREHOLE LOCATION PLAN**  
**California High Speed Train**  
**Fresno to Bakersfield**  
**Geotechnical Data Report - Package 1**

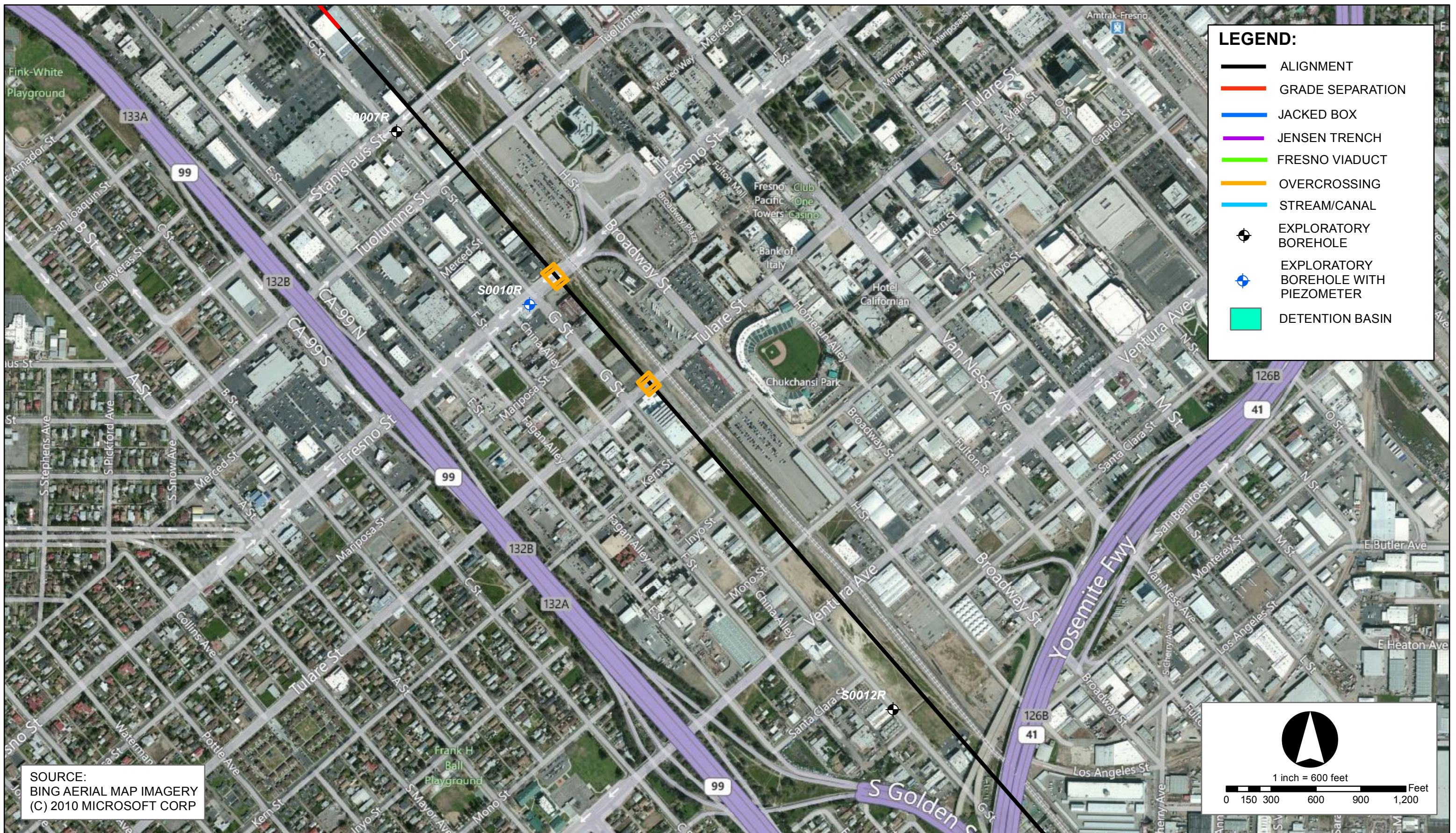
Figure No. B2  
 February 2012





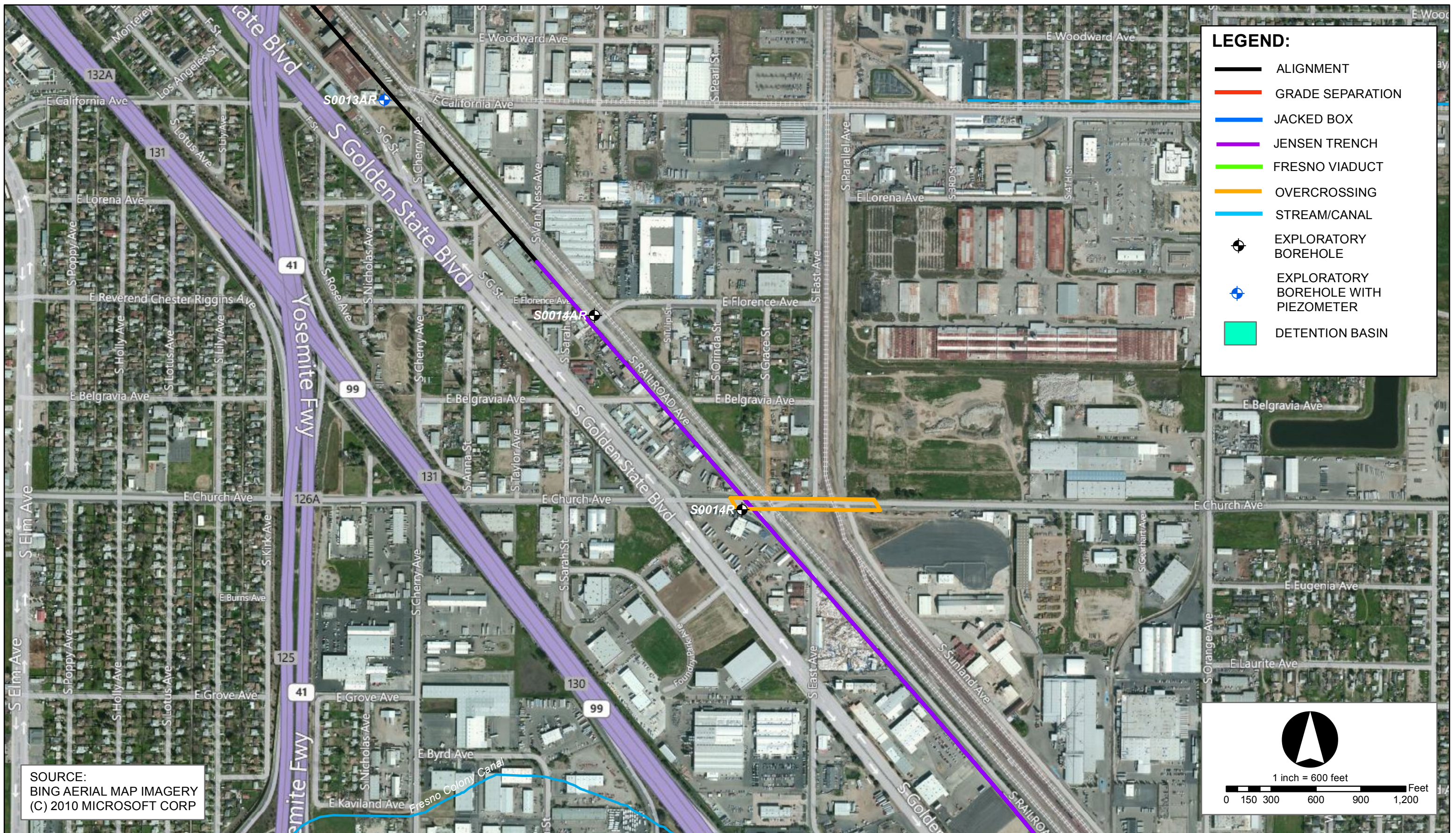
**EXPLORATORY BOREHOLE LOCATION PLAN**  
**California High Speed Train**  
**Fresno to Bakersfield**  
**Geotechnical Data Report - Package 1**  
 Figure No. B3  
 February 2012





**EXPLORATORY BOREHOLE LOCATION PLAN**  
**California High Speed Train**  
**Fresno to Bakersfield**  
**Geotechnical Data Report - Package 1**  
 Figure No. B4  
 February 2012

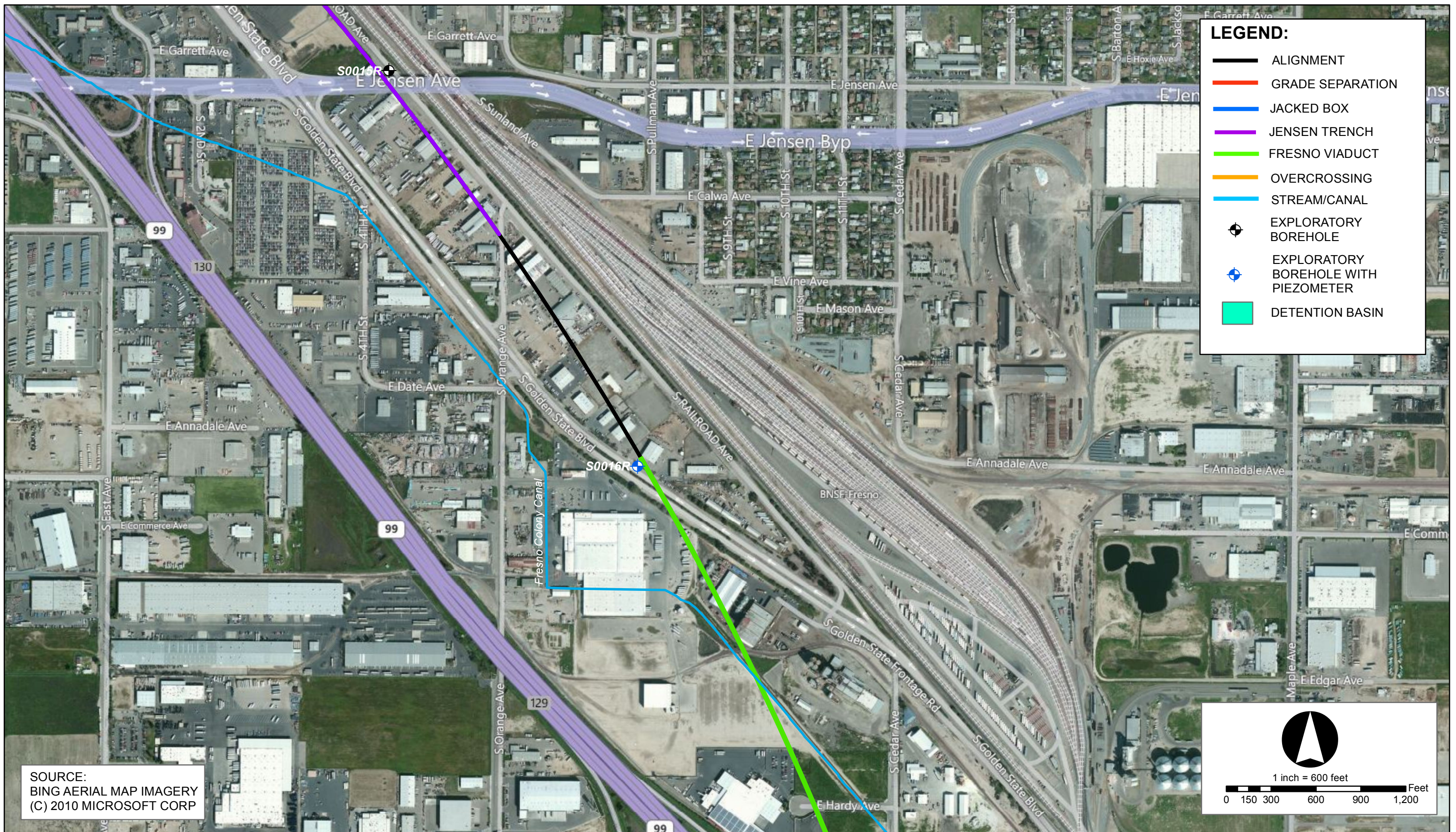




**EXPLORATORY BOREHOLE LOCATION PLAN**  
**California High Speed Train**  
**Fresno to Bakersfield**  
**Geotechnical Data Report - Package 1**

Figure No. B5  
 February 2012









**EXPLORATORY BOREHOLE LOCATION PLAN**  
**California High Speed Train**  
**Fresno to Bakersfield**  
**Geotechnical Data Report - Package 1**

Figure No. B7  
 February 2012





**EXPLORATORY BOREHOLE LOCATION PLAN**  
**California High Speed Train**  
**Fresno to Bakersfield**  
**Geotechnical Data Report - Package 1**

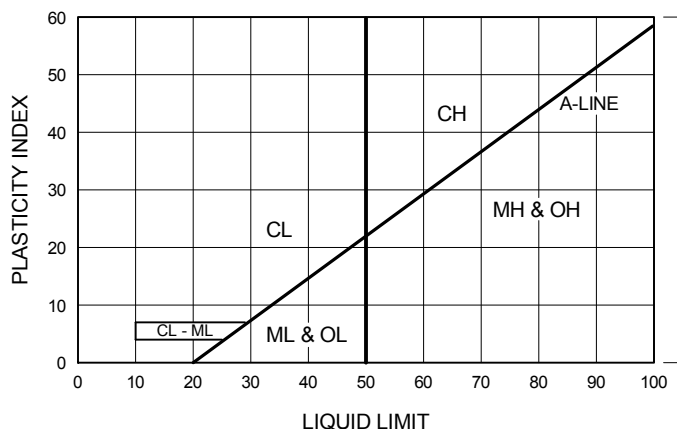
Figure No. B8  
 February 2012



# INDEXED SOIL CLASSIFICATIONS

GRAPHIC	SYMBOL	DESCRIPTION	MAJOR DIVISIONS				
	GW	WELL-GRADED GRAVELS OR GRAVEL-SAND MIXTURES, LITTLE OR NO FINES	<b>CLEAN GRAVELS</b> ( LITTLE OR NO FINES )	<b>GRAVELS</b> MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO.4 SIEVE SIZE	FOR VISUAL CLASSIFICATION, THE 1/4" SIZE MAY BE USED AS EQUIVALENT TO THE NO.4 SIEVE SIZE	<b>COARSE-GRAINED SOILS</b> MORE THAN HALF OF MATERIAL IS LARGER THAN NO.200 SIEVE SIZE	THE NO.200 U.S. STANDARD SIEVE IS ABOUT THE SMALLEST PARTICLE VISIBLE TO THE NAKED EYE
	GP	POORLY-GRADED GRAVELS OR GRAVEL-SAND MIXTURES, LITTLE OR NO FINES					
	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES	<b>GRAVELS WITH FINES</b> ( APPRECIABLE AMOUNT OF FINES )				
	GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES					
	SW	WELL-GRADED SANDS OR GRAVELLY SANDS, LITTLE OR NO FINES	<b>CLEAN SANDS</b> ( LITTLE OR NO FINES )	<b>SANDS</b> MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO.4 SIEVE SIZE			
	SP	POORLY-GRADED SANDS OR GRAVELLY SANDS, LITTLE OR NO FINES					
	SM	SILTY SANDS, SAND-SILT MIXTURES	<b>SANDS WITH FINES</b> ( APPRECIABLE AMOUNT OF FINES )				
	SC	CLAYEY SANDS, SAND-CLAY MIXTURES					
	ML	INORGANIC SILTS, VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY	<b>SILTS &amp; CLAYS</b> LIQUID LIMIT LESS THAN 50		<b>FINE-GRAINED SOILS</b> MORE THAN HALF OF MATERIAL IS SMALLER THAN NO.200 SIEVE SIZE		
	CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS					
	OL	ORGANIC SILTS AND ORGANIC SILT-CLAYS OF LOW PLASTICITY					
	MH	ORGANIC SILTS AND ORGANIC SILT-CLAYS OF HIGH PLASTICITY	<b>SILTS &amp; CLAYS</b> LIQUID LIMIT GREATER THAN 50				
	CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS					
	OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS					
	PT	PEAT AND OTHER HIGHLY ORGANIC SOILS	<b>HIGHLY ORGANIC SOILS</b>				
	OS	OILY SEDIMENTS					

## PLASTICITY CHART



## KEY TO TEST DATA

TV = POCKET TORVANE

PP = POCKET PENETROMETER

## KEY TO SAMPLER TYPE

BULK

SPT = STANDARD PENETRATION TEST SAMPLER

PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY A. Poling	BEGIN DATE Oct-10-11	COMPLETION DATE Oct-11-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2162577.132 / E6318315.079 (National Grid)		HOLE ID <b>S0001R</b>
DRILLING CONTRACTOR/DRILLER Pitcher/O. Espinosa			IN-SITU TESTING		SURFACE ELEVATION 287.44 ft (NAVD88)
DRILLING METHOD AUGER(0'-14'), MUD ROTARY(14'-51.5')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER DURING DRILLING READINGS 13.5 ft (10/10/2011)		AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 51.5 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	0		ASPHALT (4") (AC).		S01	0			60	60									Hand auger to 5.0'
			SILTY SAND (SM); brown; moist to dry; fine; trace fine subangular GRAVEL; trace SILT; [FILL].								31.9								Modified Proctor: Max $\gamma_d$ = 136.6 pcf Optimum $W_L$ = 6.4%
282.44	5		SILTY SAND (SM); medium dense; brown; moist to dry; fine to medium; little fines; weak cementation; [ALLUVIUM].		S02	5	33-16-16	32	18	6									
						6.5													
					S03	6.5	10-11-14	25	18	18									
						8					21.2								
			Poorly graded SAND with SILT (SP-SM); brown; moist to dry; fine; few SILT; weak cementation.		S04	8	10-10-10	20	18	18									
						9.5					8.7								Installed 8.5' of 5" casing
277.44	10		9.5', grades to reddish brown; moist; some SILT.		S05	9.5	9-7-7	14	18	18									
			10.5', grades yellowish brown; trace fines.			11													
			SANDY SILT (ML); very stiff; reddish brown; wet; some SAND; weak cementation.		S06	11	16-11-12	23	18	18	69.4								
						12.5													
			SILTY SAND (SM); dense; light yellowish brown; moist to dry; fine; some SILT; weak cementation.		S07	12.5	19-23-17	40	18	18									
						14					40.4/ 32.4								Driller measures water level at 13.5'
272.44	15		14.0', medium dense; brown; wet; subangular GRAVEL; fine to coarse; occasional wood debris.		S08	14	3-4-14	18	18	18									Switch to mud rotary at 14.0' (4.875" tricone bit)
						15.5					35.2								

(continued)

1.0.3 BOREHOLE LOG - CHSTP F-B CHSR F-B.GPJ ARUP DOTR LIBRARY.GLB 2/20/12



REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0001R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>1 of 3</b>	

PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY A. Poling	BEGIN DATE Oct-10-11	COMPLETION DATE Oct-11-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2162577.132 / E6318315.079 (National Grid)		HOLE ID <b>S0001R</b>
DRILLING CONTRACTOR/DRILLER Pitcher/O. Espinosa			IN-SITU TESTING		SURFACE ELEVATION 287.44 ft (NAVD88)
DRILLING METHOD AUGER(0'-14'), MUD ROTARY(14'-51.5')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER DURING DRILLING READINGS	AFTER DRILLING (DATE) 13.5 ft (10/10/2011) Not Recorded	TOTAL DEPTH OF BORING 51.5 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	20		SANDY SILT (ML); hard; dark yellowish brown with mottled red; wet; some SAND; low plasticity; weak cementation.		S09	20	18-36-39	75	18	16									
						21.5					63.7		21	3	1.4				
262.44	25		SANDY SILTY CLAY (CL-ML); hard; brown; wet; some fine SAND.		S10	25	18-22-22	44	18	12									
						26.5					50.7	13.1	18	4	2.4				
257.44	30		SILTY SAND (SM); dense; dark yellowish brown; wet; fine to medium; little SILT; weak cementation.		S11	30	18-16-20	36	18	16									
						31.5					28.9								
252.44	35		SILTY SAND (SM); dense; mottled grayish brown and reddish brown; wet; fine; little SILT; weak cementation. Poorly-graded SAND (SP); dense; mottled grayish brown and reddish brown; wet; fine; trace SILT; weak cementation.		S12	35	26-25-24	49	18	12									
						36.5													
247.44	40																		

(continued)

REPORT TITLE BORING RECORD				HOLE ID S0001R	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME California High-Speed Train					
BRIDGE NUMBER		PREPARED BY D. Maggi/T. Curran		DATE 2-20-12	SHEET 2 of 3



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY A. Poling	BEGIN DATE Oct-10-11	COMPLETION DATE Oct-11-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2162577.132 / E6318315.079 (National Grid)		HOLE ID <b>S0001R</b>
DRILLING CONTRACTOR/DRILLER Pitcher/O. Espinosa			IN-SITU TESTING		SURFACE ELEVATION 287.44 ft (NAVD88)
DRILLING METHOD AUGER(0'-14'), MUD ROTARY(14'-51.5')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER DURING DRILLING READINGS	AFTER DRILLING (DATE) Not Recorded	TOTAL DEPTH OF BORING 51.5 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	40		40.0' - 40.7', layer grades to medium grained; without reddish brown mottling.		S13	40	21-17-24	41	18	14	0.1								
						41.5													
242.44	45		SILTY CLAY (CL); hard; grayish brown with reddish brown mottling; wet; trace SAND; low to medium plasticity; weak cementation.		S14	45	8-15-50	65	18	18	97.2	31.9	37	14	2.9				
						46.5													
237.44	50		CLAYEY SILT (CL-ML); hard; grayish brown with frequent reddish brown mottling; wet; fine; trace fine SAND; low plasticity.		S15	50	28-31-47	78	18	15	90.2	22.8	26	5	1.2				
						51.5													
Borehole terminated at a depth of 51.5' on 10/11/2011.																			
For corrosion test results, see Appendix E.																			
Soil moisture indicated as "wet" because SPT samples became wet during retrieval through rotary method drilling fluid. Soil moisture indication should not be used as an indication of a potential phreatic surface or free groundwater table.																			
See Borehole Log Legend for soil classification chart and key to test data and sampler type.																			
232.44	55																		
227.44	60																		

1.0.3 BOREHOLE LOG - CHSTP F-B CHSR F-B.GPJ ARUP DOTR LIBRARY.GLB 2/20/12



REPORT TITLE BORING RECORD				HOLE ID S0001R	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME California High-Speed Train					
BRIDGE NUMBER		PREPARED BY D. Maggi/T. Curran		DATE 2-20-12	SHEET 3 of 3

PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY N. Goodenow	BEGIN DATE Oct-12-11	COMPLETION DATE Oct-13-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2158798.327 / E6322192.091 (National Grid)		HOLE ID <b>S0002R</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. Selders			IN-SITU TESTING		SURFACE ELEVATION 290.41 ft (NAVD88)
DRILLING METHOD AUGER(0'-5.5'), ROTARY(5.5'-81.5')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 3.75 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
			TOTAL DEPTH OF BORING 81.5 ft		

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	0		ASPHALT (6") (AC).	S01	0			60	60									
			AGGREGATE BASE (6") (AB).															
			SILTY SAND (SM); reddish brown; moist; fine; little SILT; trace GRAVEL; rapid dilatancy; [FILL].							23.8								
285.41	5		Poorly graded SAND (SP); reddish brown; moist; fine.	S02	5	3-3-4	7	18	16									5.0', Began using mud rotary
					6.5					19.5	3.9							
			SILTY SAND (SM); very dense; reddish brown; moist; fine; slow dilatancy; calcite seams [ALLUVIUM].	S03	6.5	4-25-47	72	18	16									
			Poorly graded SAND with SILT (SP-SM); very dense; reddish brown; moist; fine; few SILT.		8													
			SILTY SAND (SM); very dense; reddish brown; moist to wet; fine; some SILT.	S04	8	29-52-50	102/ 9.75"	16	16									
					9.5					42.3/ 41.3	10.5							
280.41	10		SILTY SAND (SM); very dense; reddish brown; wet; fine; little SILT.	S05	9.5	36-43-22	65	18	16									
					11					29	15.1							
			11.0', grades brown.	S06	11	8-16-41	57	18	13									
			Becomes less cemented. Cementation ends at 11.9'. Calcite seams end.		12.5													
			Poorly-graded SAND (SP); medium dense; grayish brown; wet; fine to medium; trace SILT; weak cementation.	S07	12.5	12-15-13	28	18	13									
			Calcite seams in the top 4".		14													
275.41	15		14.0', grades mostly medium-grained; subrounded; white calcite seams; primarily quartz and muscovite.	S08	14	6-7-10	17	18	14									
					15.5					2.8								

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0002R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>1 of 5</b>	



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY N. Goodenow	BEGIN DATE Oct-12-11	COMPLETION DATE Oct-13-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2158798.327 / E6322192.091 (National Grid)		HOLE ID <b>S0002R</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. Selders			IN-SITU TESTING		SURFACE ELEVATION 290.41 ft (NAVD88)
DRILLING METHOD AUGER(0'-5.5'), ROTARY(5.5'-81.5')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 3.75 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 81.5 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	20		Poorly graded SAND (SP); dense; grayish brown; wet; fine; few SILT; weak cementation.		S09	20	21-18-14	32	18	14	3.5	14.8							
						21.5													
265.41	25		SILTY SAND (SM); medium dense; grayish brown; wet; fine to coarse; little SILT; weak cementation.		S10	25	6-8-9	17	18	14	15.7								
						26.5													
260.41	30		SILTY SAND (SM); dense; olive brown; wet; fine; little SILT; weak cementation; frequent reddish brown oxidation partings.		S11	30	18-21-21	42	18	16	43.5 45.6	15							
						31.5													
255.41	35		SILT (ML); stiff to hard; olive brown; wet; fine; few SAND; low plasticity.		S12	35	16-24-36	60	18	17	86.4	28.6	32	3	2.2				
						36.5													
250.41	40																		

(continued)

REPORT TITLE BORING RECORD				HOLE ID S0002R	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME California High-Speed Train					
BRIDGE NUMBER		PREPARED BY D. Maggi/T. Curran		DATE 2-20-12	SHEET 2 of 5



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>			
LOGGED BY N. Goodenow		BEGIN DATE Oct-12-11	COMPLETION DATE Oct-13-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2158798.327 / E6322192.091 (National Grid)		HOLE ID <b>S0002R</b>	
DRILLING CONTRACTOR/DRILLER Gregg/D. Selders				IN-SITU TESTING		SURFACE ELEVATION 290.41 ft (NAVD88)	
DRILLING METHOD AUGER(0'-5.5'), ROTARY(5.5'-81.5')				DRILL RIG Mobil B-80		BOREHOLE DIAMETER 3.75 in	
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")				SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%	
BOREHOLE BACKFILL AND COMPLETION Neat cement grout				GROUNDWATER DURING DRILLING READINGS Not Recorded		AFTER DRILLING (DATE) Not Recorded	
						TOTAL DEPTH OF BORING 81.5 ft	

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	40		SANDY SILTY CLAY (CL-ML); very stiff to hard; brown; wet; some fine SAND; trace coarse SAND; low plasticity; slow dilatancy.		S13	40	12-13-24	37	18	16									PP: 2.5 tsf TV: 2.1 tsf
						41.5					52	16.5	22	7	2.1				
245.41	45		SILT with SAND (ML); hard; brown; wet; fine; little SAND; no plasticity; slow dilatancy; weak cementation; trace organics; frequent calcite seams; frequent reddish brown partings.		S14	45	15-22-25	47	18	17									Atterberg Limits: NP
						46.5					81.7	29.2 27.9			2.4				
240.41	50		SANDY SILT (ML); hard; olive brown; wet; fine; some SAND; weak cementation; frequent reddish brown pockets of oxidation.		S15	50	19-22-17	39	18	16									
						51.5					65.7	29.8							
235.41	55		Poorly-graded SAND (SP); very dense; olive brown; wet; fine; trace SILT; low dilatancy; weak cementation; frequent reddish brown staining.		S16	55	19-26-28	54	18	18									
						56.5													
230.41	60																		

(continued)

1.0.3 BOREHOLE LOG - CHSTP F-B CHSR F-B.GPJ ARUP DOTR LIBRARY.GLB 2/20/12



REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0002R</b>	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>					
BRIDGE NUMBER		PREPARED BY <b>D. Maggi/T. Curran</b>		DATE <b>2-20-12</b>	SHEET <b>3 of 5</b>



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY N. Goodenow	BEGIN DATE Oct-12-11	COMPLETION DATE Oct-13-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2158798.327 / E6322192.091 (National Grid)		HOLE ID <b>S0002R</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. Selders			IN-SITU TESTING		SURFACE ELEVATION 290.41 ft (NAVD88)
DRILLING METHOD AUGER(0'-5.5'), ROTARY(5.5'-81.5')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 3.75 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 81.5 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
60					S17	60	17-50	50/5"	11	11									
			SILTY SAND (SM); very dense; reddish brown; wet; fine; some SILT; frequent interbedded layers of grayish brown SILT; no cementation.			61.5					49.3	12.5							
225.41	65				S18	65	21-50	50/5"	11	11									
			66.2', olive brown; some fine SAND; trace coarse SAND; weak cementation.			66.5													
220.41	70				S19	70	18-43-57	100	18	18									
			SILT with SAND (ML); hard; olive brown; wet; few coarse SAND; low plasticity; weak cementation.			71.5					82.4	31.7/30.5	31	7	3.3				
215.41	75				S20	75	14-18-21	39	18	18									
			Poorly-graded SAND (SP); dense; grayish brown; wet; fine; trace fines; rapid dilatancy; weak cementation.			76.5													
210.41	80																		

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0002R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>4 of 5</b>	





PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>			
LOGGED BY N. Goodenow		BEGIN DATE Oct-12-11	COMPLETION DATE Oct-13-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2158798.327 / E6322192.091 (National Grid)		HOLE ID <b>S0002R</b>	
DRILLING CONTRACTOR/DRILLER Gregg/D. Selders				IN-SITU TESTING		SURFACE ELEVATION 290.41 ft (NAVD88)	
DRILLING METHOD AUGER(0'-5.5'), ROTARY(5.5'-81.5')				DRILL RIG Mobil B-80		BOREHOLE DIAMETER 3.75 in	
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")				SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%	
BOREHOLE BACKFILL AND COMPLETION Neat cement grout				GROUNDWATER DURING DRILLING READINGS Not Recorded		AFTER DRILLING (DATE) Not Recorded	
						TOTAL DEPTH OF BORING 81.5 ft	

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
80			SANDY SILT (ML); hard; grayish brown; wet; some fine SAND.		S21	80	16-23-41	64	18	17	65.4								
						81.5													
			Borehole terminated at a depth of 81.5' on 10/13/2011.																
			For corrosion test results, see Appendix E.																
			Soil moisture indicated as "wet" because SPT samples became wet during retrieval through rotary method drilling fluid. Soil moisture indication should not be used as an indication of a potential phreatic surface or free groundwater table.																
205.41	85		See Borehole Log Legend for soil classification chart and key to test data and sampler type.																
200.41	90																		
195.41	95																		
190.41	100																		

1.0.3 BOREHOLE LOG - CHSTP F-B CHSR F-B.GPJ ARUP DOTR LIBRARY.GLB 2/20/12



REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0002R</b>	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>					
BRIDGE NUMBER		PREPARED BY <b>D. Maggi/T. Curran</b>		DATE <b>2-20-12</b>	SHEET <b>5 of 5</b>

PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY A. Poling	BEGIN DATE Oct-12-11	COMPLETION DATE Oct-13-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2157250.773 / E6323232.859 (National Grid)		HOLE ID <b>S0003R</b>
DRILLING CONTRACTOR/DRILLER Pitcher/O. Espinosa			IN-SITU TESTING Standpipe Piezometer		SURFACE ELEVATION 287.98 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-82')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
			TOTAL DEPTH OF BORING 82 ft		

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests
	0		ASPHALT (5) (AC).	S01	0			60	60								Hand auger to 5.0'
			SILTY SAND (SM); brown; moist to dry; fine; subangular; trace GRAVEL; little SILT; weak to moderate cementation; [FILL].							24.1							Modified Proctor: Max $\gamma_d = 136.7$ pcf Optimum $W_L = 6.4\%$
282.98	5		5.0' - 6.5', grades loose; weak cementation.	S02	5	3-3-3	6	18	18								Set-up for rotary drilling at 5.0' using 4.875" tricone bit
			6.5' - 7.2', grades to medium; wet.	S03	6.5	8-9-8	17	18	18								
			SILTY SAND (SM); brown; moist; fine; some SAND; weak cementation; [ALLUVIUM].		8												
			SILT (ML); very stiff; reddish brown; wet; fine; few SAND; weak cementation.	S04	8	34-50	50/6"	12	12	43.1/44.9/89.7							
			9.0', grades to reddish brown mottled with grayish brown.		9.5												
277.98	10		SANDY CLAY (CL); hard; grayish brown; wet; fine; some SAND; SILT; interbedded layers of SAND; medium plasticity; weak cementation.	S05	9.5	22-20-22	42	18	18	58.3	18.5	28	12	3			
			SANDY SILT (ML); hard; grayish brown; wet; fine; little SAND; low plasticity.	S06	11	29-39-50	89/11.5"	18	18	69.4	24.7	32	6	1.9			
				S07	12.5	17-9-9	18	18	17								
			Poorly graded SAND with SILT (SP-SM); medium dense; brown; wet; fine; few SILT; weak cementation.		14												
272.98	15		14.7' - 15.5', grades to dark yellowish brown; medium.	S08	14	5-8-15	23	18	14	10.2							
					15.5												

(continued)

REPORT TITLE BORING RECORD				HOLE ID S0003R	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME California High-Speed Train					
BRIDGE NUMBER		PREPARED BY D. Maggi/T. Curran		DATE 2-20-12	SHEET 1 of 5



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY A. Poling	BEGIN DATE Oct-12-11	COMPLETION DATE Oct-13-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2157250.773 / E6323232.859 (National Grid)		HOLE ID <b>S0003R</b>
DRILLING CONTRACTOR/DRILLER Pitcher/O. Espinosa			IN-SITU TESTING Standpipe Piezometer		SURFACE ELEVATION 287.98 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-82')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 82 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	20		SILT (ML); very stiff; grayish brown; wet; few fine SAND; low plasticity; weak cementation.		S09	20	5-10-6	16	18	13									
						21.5					91.2		24	1	1.3				
262.98	25		Poorly graded SAND with SILT (SP-SM); medium dense; brown and dark yellowish brown; wet; fine; few SILT; weak cementation.		S10	25	9-11-12	23	18	17									
						26.5					8.7								
257.98	30		30'-31' grades fine to coarse; subrounded.		S11	30	15-15-22	37	18	11									
						31.5					6.5								
252.98	35		CLAYEY SILT (CL-ML); hard; grayish brown with reddish brown mottling; wet; fine; little SAND; low plasticity.		S12	35	33-45-48	93	18	14									
						36.5					88.3	23.8	28	6	2.3				
247.98	40																		

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0003R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>2 of 5</b>	



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY A. Poling	BEGIN DATE Oct-12-11	COMPLETION DATE Oct-13-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2157250.773 / E6323232.859 (National Grid)		HOLE ID <b>S0003R</b>
DRILLING CONTRACTOR/DRILLER Pitcher/O. Espinosa			IN-SITU TESTING Standpipe Piezometer		SURFACE ELEVATION 287.98 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-82')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 82 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	40		SANDY SILTY CLAY (CL-ML); hard; grayish brown with frequent reddish brown mottling; wet; low plasticity; weak to moderate cementation.		S13	40	19-20-22	42	18	18									
						41.5					53.6	15.5	17	4	2.3				
242.98	45		Poorly graded SAND (SP); very dense; grayish brown with layers of brown; wet; fine; trace fine SILT; weak to moderate cementation.		S14	45	15-21-42	63	18	18									
						46.5													
237.98	50		Poorly graded SAND with SILT (SP-SM); very dense; grayish brown to dark yellowish brown.		S15	50	31-26-33	59	18	10									
						51.5					11.5								
232.98	55		SILT (ML); hard; grayish brown with reddish mottling; wet; fine; trace organics; low plasticity.		S16	55	35-39-50	89	18	16									
						56.5					85.7		22	3	1.9				
227.98	60																		

(continued)

REPORT TITLE BORING RECORD				HOLE ID S0003R	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME California High-Speed Train					
BRIDGE NUMBER		PREPARED BY D. Maggi/T. Curran		DATE 2-20-12	SHEET 3 of 5



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY A. Poling	BEGIN DATE Oct-12-11	COMPLETION DATE Oct-13-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2157250.773 / E6323232.859 (National Grid)		HOLE ID <b>S0003R</b>
DRILLING CONTRACTOR/DRILLER Pitcher/O. Espinosa			IN-SITU TESTING Standpipe Piezometer		SURFACE ELEVATION 287.98 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-82')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 82 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
60			SILTY CLAY (CL-ML); hard; grayish brown with red brown mottling; wet; some fine SAND; low plasticity. 60.7', grades to reddish brown.		S17	60	44-32-37	69	18	18									
						61.5					50.7	18.6	21	5	3.4				
222.98	65		65.0', SAND grades coarse.		S18	65	33-50	50/ 6"	12	12									
						66.5													
217.98	70		SILTY SAND (SM); very dense; grayish brown with brown mottling; wet; fine; some SILT.		S19	70	31-38-50	88/ 12"	18	18									
						71.5					41.7								
212.98	75		SILT (ML); hard; grayish brown with reddish brown mottling; wet; few fine SAND; no plasticity. 76.0', grades to grayish brown.		S20	75	29-31-50	81/ 11"	17	16									
						76.5					91.6	29.5			1.8				
207.98	80																		Atterberg Limits: NP

(continued)

REPORT TITLE BORING RECORD				HOLE ID S0003R	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME California High-Speed Train					
BRIDGE NUMBER		PREPARED BY D. Maggi/T. Curran		DATE 2-20-12	SHEET 4 of 5



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>			
LOGGED BY A. Poling		BEGIN DATE Oct-12-11	COMPLETION DATE Oct-13-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2157250.773 / E6323232.859 (National Grid)		HOLE ID <b>S0003R</b>	
DRILLING CONTRACTOR/DRILLER Pitcher/O. Espinosa				IN-SITU TESTING Standpipe Piezometer		SURFACE ELEVATION 287.98 ft (NAVD88)	
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-82')				DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in	
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")				SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%	
BOREHOLE BACKFILL AND COMPLETION Neat cement grout				GROUNDWATER DURING DRILLING READINGS Not Recorded		AFTER DRILLING (DATE) Not Recorded	
						TOTAL DEPTH OF BORING 82 ft	

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
80				X	S21	80	50	50/	18	6									
						81.5													
			<p>Borehole terminated at a depth of 82.0' on 10/12/2011. Reamed out hole with 5.875" tricone bit to install piezometer. Installed standpipe piezometer on 10/13/2011.</p> <p>For corrosion test results, see Appendix E.</p> <p>Soil moisture indicated as "wet" because SPT samples became wet during retrieval through rotary method drilling fluid. Soil moisture indication should not be used as an indication of a potential phreatic surface or free groundwater table.</p> <p>See Borehole Log Legend for soil classification chart and key to test data and sampler type.</p>																
202.98	85																		
197.98	90																		
192.98	95																		
187.98	100																		

1.0.3 BOREHOLE LOG - CHSTP F-B CHSR F-B.GPJ ARUP DOTR LIBRARY.GLB 2/20/12



REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0003R</b>	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>					
BRIDGE NUMBER		PREPARED BY <b>D. Maggi/T. Curran</b>		DATE <b>2-20-12</b>	SHEET <b>5 of 5</b>

PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY A. Poling	BEGIN DATE Oct-24-11	COMPLETION DATE Oct-25-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2156592.751 / E6324256.277 (National Grid)		HOLE ID <b>S0004R</b>
DRILLING CONTRACTOR/DRILLER Pitcher/W. Stewart			IN-SITU TESTING		SURFACE ELEVATION 283.69 ft (NAVD88)
DRILLING METHOD AUGER(0'-15.5'), ROTARY(15.5'-81.5')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 3.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 81.5 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	0		CONCRETE (12") (CR).		S01	0			60	60									Hand auger/garbage barrel to 5.0'
			SILT (ML); reddish brown and brown; moist to dry; fine to medium SAND; weak cementation; [FILL].								51.8								Modified Proctor: Max $\gamma_d = 121$ pcf Optimum $W_L = 12.2\%$
	5		5.0' Grades to brown.		S02	5	7-33-42	75	18	18									
278.69			SILTY SAND (SM); very dense; reddish brown with reddish layers; moist to dry; fine to medium SAND; [ALLUVIUM].			6.5													
			SANDY SILT (ML); hard; reddish brown with brown layers; moist to dry; trace fine GRAVEL; fine to medium SAND; low plasticity.		S03	6.5	20-41-50	91/10"	16	16									
						8					59.9	25.2	27	1	3.1				
			SILTY SAND (SM); hard; brown; moist to dry; little SILT.		S04	8	13-16-14	30	18	16									
						9.5					24								
			9.1', grades to grayish brown.																
273.69	10		SANDY CLAY (CL); hard; grayish brown; dry; some fine SAND; trace medium to coarse SAND; low plasticity; weak cementation.		S05	9.5	11-23-40	63	18	18									
			Poorly graded SAND with SILT (SP-SM); very dense; brown; moist to dry; few SILT; fine to medium SAND; trace coarse SAND; weak cementation.			11													
			11.0', grades to grayish brown with reddish brown mottling.		S06	11	25-27-39	66	18	18									
						12.5													
			SANDY SILT (ML); hard; reddish brown with reddish mottling; moist to dry; some SAND; low plasticity; weak cementation.		S07	12.5	11-12-10	22	18	13									
						14					52.1	10.3	17	2	1.7				
			SANDY SILTY CLAY (CL-ML); very stiff; grayish brown; moist to dry; some fine SAND; trace medium to coarse SAND; low plasticity; weak cementation.								65.4	12.8	19	4	2				
			13.1', grades to brown with occasional dark brown mottling; fine to medium SAND.		S08	14	8-8-10	18	18	18									
268.69	15					15.5					65.5	16.1	19	2	1.4				
			SANDY SILT (ML); very stiff; grayish brown; moist; some fine SAND; weak cementation.																
263.69	20																		

(continued)

REPORT TITLE BORING RECORD				HOLE ID S0004R	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME California High-Speed Train					
BRIDGE NUMBER		PREPARED BY D. Maggi/T. Curran		DATE 2-20-12	SHEET 1 of 5





PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY A. Poling	BEGIN DATE Oct-24-11	COMPLETION DATE Oct-25-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2156592.751 / E6324256.277 (National Grid)		HOLE ID <b>S0004R</b>
DRILLING CONTRACTOR/DRILLER Pitcher/W. Stewart			IN-SITU TESTING		SURFACE ELEVATION 283.69 ft (NAVD88)
DRILLING METHOD AUGER(0'-15.5'), ROTARY(15.5'-81.5')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 3.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
			TOTAL DEPTH OF BORING 81.5 ft		

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	20		SILT (ML); hard; grayish brown with frequent reddish brown mottling; moist to wet; few SAND.		S09	20	9-13-12	25	18	18									
						21.5					89.8								
	25		SILTY SAND (SM); dense; reddish brown; wet; little SILT; fine to medium SAND; weak cementation.		S10	25	9-16-26	42	18	10									
			SILT (ML); hard; grayish brown with reddish brown mottling; wet; some fine SAND.			26.5					79	19.2							
	30		SILTY SAND (SM); dense; brown; wet; some SILT; weak cementation.		S11	30	18-20-16	36	18	17									
			30.9' SILT lens; brown with reddish brown mottling; fine to medium SAND.			31.5					28.4	82.8							
	35		35.0', grades to very dense; reddish brown.		S12	35	11-23-41	64	18	16									
						36.5					32.1								
	40																		

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0004R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>2 of 5</b>	





PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY A. Poling	BEGIN DATE Oct-24-11	COMPLETION DATE Oct-25-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2156592.751 / E6324256.277 (National Grid)		HOLE ID <b>S0004R</b>
DRILLING CONTRACTOR/DRILLER Pitcher/W. Stewart			IN-SITU TESTING		SURFACE ELEVATION 283.69 ft (NAVD88)
DRILLING METHOD AUGER(0'-15.5'), ROTARY(15.5'-81.5')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 3.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
			TOTAL DEPTH OF BORING 81.5 ft		

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	40		SANDY SILT (ML); hard; grayish brown; wet; fine; some SAND.		S13	40	9-17-19	36	18	12	63.4								
						41.5													
238.69	45		SANDY SILTY CLAY (CL-ML); hard; grayish brown with reddish brown mottling; wet; trace medium to coarse SAND; low plasticity; weak cementation.		S14	45	24-50	50/ 5.5"	12	10	60.5	20.2	22	5	2.3				
						46.5													
233.69	50		50.0', grades to grayish brown.		S15	50	50	50/ 5"	5	4									
						51.5													
			51.5', grades to grayish brown with reddish mottling.		S16	51.5	17-23-27	50	18	13									
						53													
					S17	53	18-29-40	69	18	16									
			SILT (ML); hard; grayish brown with reddish brown; wet; trace fine SAND; weak cementation.			54.5					96.9	30.1							
228.69	55		SILT with SAND (ML); hard; grayish brown with reddish brown mottling; wet; little fine to medium SAND; medium plasticity; weak cementation.		S18	54.5	31-45-50	95/ 9"	15	15	82.9	35.7	39	10					
						56													

(continued)

1.0.3 BOREHOLE LOG - CHSTP F-B CHSR F-B.GPJ ARUP DOTR LIBRARY.GLB 2/20/12



REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0004R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>3 of 5</b>	

PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY A. Poling	BEGIN DATE Oct-24-11	COMPLETION DATE Oct-25-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2156592.751 / E6324256.277 (National Grid)		HOLE ID <b>S0004R</b>
DRILLING CONTRACTOR/DRILLER Pitcher/W. Stewart			IN-SITU TESTING		SURFACE ELEVATION 283.69 ft (NAVD88)
DRILLING METHOD AUGER(0'-15.5'), ROTARY(15.5'-81.5')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 3.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
			TOTAL DEPTH OF BORING 81.5 ft		

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
60			Poorly graded SAND with SILT (SP-SM); very dense; grayish brown with reddish brown mottling; wet; few SILT; medium SAND; trace subangular GRAVEL; weak cementation.	X	S19	60	32-50	50/ 3"	12	8									
						61.5													
218.69	65		Poorly graded SAND (SP); very dense; brown; wet; trace SILT; fine to medium SAND; weak cementation.	X	S20	65	33-30-26	56	18	16									
			SANDY SILTY CLAY (CL-ML); hard; grayish brown; wet; little fine SAND; trace medium SAND; low plasticity; weak cementation.	X		66.5					67.3	24.6	26	7	2.1				
213.69	70		SANDY SILT (ML); hard; grayish brown; wet; some fine SAND.	X	S21	70	32-50	50/ 5"	11	11									
						71.5					55.5	31.5/ 30.5	33	8	2.3				
208.69	75		Poorly graded SAND (SP); dense; brown; wet; trace SILT; medium SAND; weak cementation.	X	S22	75	29-22-16	38	18	13									
						76.5													
203.69	80																		

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0004R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>4 of 5</b>	



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY A. Poling	BEGIN DATE Oct-24-11	COMPLETION DATE Oct-25-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2156592.751 / E6324256.277 (National Grid)		HOLE ID <b>S0004R</b>
DRILLING CONTRACTOR/DRILLER Pitcher/W. Stewart			IN-SITU TESTING		SURFACE ELEVATION 283.69 ft (NAVD88)
DRILLING METHOD AUGER(0'-15.5'), ROTARY(15.5'-81.5')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 3.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 81.5 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
80			80.0', grades to grayish brown; fine to medium SAND.		S23	80	11-21-18	39	18	14									
			80.6', grades to fine SAND.			81.5													
<p>Borehole terminated at a depth of 81.5' on 10/24/2011.</p> <p>For corrosion test results, see Appendix E.</p> <p>Soil moisture indicated as "wet" because SPT samples became wet during retrieval through rotary method drilling fluid. Soil moisture indication should not be used as an indication of a potential phreatic surface or free groundwater table.</p> <p>See Borehole Log Legend for soil classification chart and key to test data and sampler type.</p>																			
198.69	85																		
193.69	90																		
188.69	95																		
183.69	100																		



REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0004R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>5 of 5</b>	

PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY A. Poling	BEGIN DATE Oct-13-11	COMPLETION DATE Oct-14-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2155457.493 / E6325238.589 (National Grid)		HOLE ID <b>S0005R</b>
DRILLING CONTRACTOR/DRILLER Pitcher/Oscar			IN-SITU TESTING Standpipe Piezometer; PS Logging		SURFACE ELEVATION 285.26 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-82')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION N/A			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 82 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	0		ASPHALT (7") (AC).		S01	0			60	60									Hand auger to 5.0'
			Poorly graded SAND with SILT (SP-SM); brown; dry; fine; subangular; trace SILT; trace coarse SAND; weak cementation; [FILL].			5													Modified Proctor: Max $\gamma_d$ = 133.9 pcf Optimum $W_i$ = 6%
280.26	5				S02	5	5-5-49	54	18	18									Set up mud rotary at 5.0' using 4.875" tricone bit; casing at 5.0'
			Poorly graded SAND with SILT (SP-SM); very dense; reddish brown; dry; fine; few SILT; trace coarse SAND; weak to moderate cementation; [ALLUVIUM].		S03	6.5	50	50/ 3.5"	4	4	13.8								7.0', driller notes hard material
			8' grades to brown.		S04	8	50	50/ 6"	6	6									
						9.5													
275.26	10		SANDY SILT (ML); hard; reddish brown with grayish brown mottling; moist; fine; trace organics; some fine SAND; low plasticity.		S05	9.5	17-34-37	71	18	14									
						11					59.7	21.1	26	4	1.9				
			SANDY SILT (ML); reddish brown with grayish mottling; moist; fine; trace organics; some fine SAND; low plasticity.		S06	11	9-23-22	45	18	14									
						12.5					57.6	21.8	23	3	1.5				
			SANDY SILTY CLAY (CL-ML); brown with reddish mottling; wet.		S07	12.5	21-42-50	92/ 10.5"	17	13									
						14					67.7	18.4	23	5	2.1				
			SANDY SILT (ML); brown.		S08	14	28-50	50/ 5"	18	10									
270.26	15					15.5					54.7								15.0', ends continuous sampling

(continued)

1.0.3 BOREHOLE LOG - CHSTP F-B CHSR F-B.GPJ ARUP DOTR LIBRARY.GLB 2/20/12



REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0005R</b>	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>					
BRIDGE NUMBER		PREPARED BY <b>D. Maggi/T. Curran</b>		DATE <b>2-20-12</b>	SHEET <b>1 of 5</b>

PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY A. Poling	BEGIN DATE Oct-13-11	COMPLETION DATE Oct-14-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2155457.493 / E6325238.589 (National Grid)		HOLE ID <b>S0005R</b>
DRILLING CONTRACTOR/DRILLER Pitcher/Oscar			IN-SITU TESTING Standpipe Piezometer; PS Logging		SURFACE ELEVATION 285.26 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-82')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION N/A			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 82 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	20		SILTY SAND (SM); dense; mottled dark reddish brown with grayish brown; wet; fine; little SILT; weak cementation.	X	S09	20	11-13-19	32	18	10	17.5								
						21.5													
260.26	25		SILT (ML); very stiff; mottled dark grayish brown with reddish brown; wet; few SAND.	X	S10	25	10-11-13	24	18	10	91.9								
						26.5													
255.26	30		SILTY CLAY with SAND (CL-ML); hard; grayish brown with reddish brown mottling; wet; fine; trace organics; some SAND; low plasticity.	X	S11	30	12-17-22	39	18	18	74.4	17	25	7	2.7				
						31.5													
250.26	35		Poorly graded SAND with SILT (SP-SM); very dense; grayish brown with dark yellowish brown mottling; wet; fine to medium; few SILT; weak cementation.	X	S12	35	26-42-50	92/11.5"	18	14	7.3								
						36.5													
245.26	40																		

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0005R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>2 of 5</b>	



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY A. Poling	BEGIN DATE Oct-13-11	COMPLETION DATE Oct-14-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2155457.493 / E6325238.589 (National Grid)		HOLE ID <b>S0005R</b>
DRILLING CONTRACTOR/DRILLER Pitcher/Oscar			IN-SITU TESTING Standpipe Piezometer; PS Logging		SURFACE ELEVATION 285.26 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-82')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION N/A			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 82 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	40		SANDY SILT (ML); hard; brown with reddish brown mottling with seams of grayish brown; wet; little organics; some coarse SAND; low plasticity; weak cementation.		S13	40	30-36-50	86/11"	17	17									
						41.5					59.5	24.3	33	6	5.1				
240.26	45		SILT with SAND (ML); hard; grayish brown with reddish brown mottling; wet; trace organics; low plasticity.		S14	45	21-50	50/4.5"	11	11									
						46.5					79.7	33.1	36	9	3.5				
			SANDY SILT (ML); hard; grayish brown with reddish brown mottling; wet.		S15	46.5	30-50	50/5.5"	12	12									
						48					56.6/62.3				0				
					S16	48	18-26-25	51	18	16									
						49.5													
235.26	50		SANDY SILTY CLAY (CL-ML); hard; brown with reddish brown mottling; wet; some SAND; low plasticity.		S17	49.5	27-37-37	74	18	15									
						51					64.5	19.8	24	4	1.8				
230.26	55		Poorly graded SAND with SILT (SP-SM); very dense; brown; wet; fine; few SILT; weak cementation.		S18	55	20-27-31	58	18	16									
						56.5					9								
225.26	60																		

(continued)

REPORT TITLE BORING RECORD				HOLE ID S0005R	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME California High-Speed Train					
BRIDGE NUMBER		PREPARED BY D. Maggi/T. Curran		DATE 2-20-12	SHEET 3 of 5



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY A. Poling	BEGIN DATE Oct-13-11	COMPLETION DATE Oct-14-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2155457.493 / E6325238.589 (National Grid)		HOLE ID <b>S0005R</b>
DRILLING CONTRACTOR/DRILLER Pitcher/Oscar			IN-SITU TESTING Standpipe Piezometer; PS Logging		SURFACE ELEVATION 285.26 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-82')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION N/A			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
			TOTAL DEPTH OF BORING 82 ft		

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
60					S19	60	16-18-21	39	18	16									
						61.5													
220.26	65		65.0', grades to reddish brown; fine to medium SAND.		S20	65	50	50/5.5"	6	6									
						66.5													
215.26	70		SILTY SAND (SM); very dense; reddish brown with yellowish brown; wet; fine; some SILT; weak cementation.		S21	70	24-27-31	58	18	15									
						71.5													
											16								
											38.2								
210.26	75		Poorly graded SAND (SP); very dense; yellowish brown; wet; medium.		S22	75	17-25-30	55	18	14									
						76.5													
205.26	80																		

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0005R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>4 of 5</b>	



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>			
LOGGED BY A. Poling		BEGIN DATE Oct-13-11	COMPLETION DATE Oct-14-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2155457.493 / E6325238.589 (National Grid)		HOLE ID <b>S0005R</b>	
DRILLING CONTRACTOR/DRILLER Pitcher/Oscar				IN-SITU TESTING Standpipe Piezometer; PS Logging		SURFACE ELEVATION 285.26 ft (NAVD88)	
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-82')				DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in	
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")				SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%	
BOREHOLE BACKFILL AND COMPLETION N/A				GROUNDWATER DURING DRILLING Not Recorded		AFTER DRILLING (DATE) Not Recorded	
				READINGS		TOTAL DEPTH OF BORING 82 ft	

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
80			SILT with SAND (ML); hard; brown with reddish brown mottling; wet; some fine SAND; weak cementation.	X	S23	80	50	50/5	5	5	74.9								
						81.5													
			<p>Borehole terminated at a depth of 82.0' on 10/14/2011. Overdrilled hole to 95.0' for PS Logging.</p> <p>For corrosion test results, see Appendix E.</p> <p>Soil moisture indicated as "wet" because SPT samples became wet during retrieval through rotary method drilling fluid. Soil moisture indication should not be used as an indication of a potential phreatic surface or free groundwater table.</p> <p>See Borehole Log Legend for soil classification chart and key to test data and sampler type.</p>																
200.26	85																		
195.26	90																		
190.26	95																		
185.26	100																		

1.0.3 BOREHOLE LOG - CHSTP F-B CHSR F-B.GPJ ARUP DOTR LIBRARY.GLB 2/20/12



REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0005R</b>	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>					
BRIDGE NUMBER		PREPARED BY <b>D. Maggi/T. Curran</b>		DATE <b>2-20-12</b>	SHEET <b>5 of 5</b>



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY N. Goodenow	BEGIN DATE Oct-13-11	COMPLETION DATE Oct-13-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2154688.474 / E6325497.455 (National Grid)		HOLE ID <b>S0006R</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. Selders			IN-SITU TESTING		SURFACE ELEVATION 287.64 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-81.5')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 3.75 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 81.5 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests
	0		ASPHALT (8") (AC).	S01	0			60	60								Hand auger to 5.0'
			AGGREGATE BASE (8") (AB).														
			Poorly graded SAND with SILT (SP-SM); loose; brown; moist; medium; subrounded; rapid dilatancy; [FILL].							13.9							
	5				5												
282.64				S02	5	2-3-4	7	18	18								
					6.5												
			SILTY SAND (SM); very dense; reddish brown; wet; medium; subrounded; little SILT; slow dilatancy; few calcite seams [ALLUVIUM].	S03	6.5	22-50-51	101	18	18								
					8												
				S04	8	16-25-24	49	18	16								
					9.5					43.8							
277.64	10		Grades medium dense; no calcite seams; some SILT.	S05	9.5	14-13-10	23	18	15								
					11												
				S06	11	7-7-7	14	18	16								
					12.5												
			Grades dense.	S07	12.5	7-17-27	44	18	15								
			13.25', dense; olive brown and reddish brown; fine; few calcite streaks.		14												
272.64	15		SANDY SILT (ML); hard; brown to reddish brown; wet; slow dilatancy; calcite seams.	S08	14	10-16-15	31	18	14								
					15.5					68.2	21.9						

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0006R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>		DATE <b>2-20-12</b>	SHEET <b>1 of 5</b>



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY N. Goodenow	BEGIN DATE Oct-13-11	COMPLETION DATE Oct-13-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2154688.474 / E6325497.455 (National Grid)		HOLE ID <b>S0006R</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. Selders			IN-SITU TESTING		SURFACE ELEVATION 287.64 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-81.5')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 3.75 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 81.5 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	20		SILT with SAND (ML); stiff; brown; wet; little fine SAND; slow dilatancy.		S09	20	3-4-6	10	18	13									
						21.5					75.2								
262.64	25		25' grades to hard; rapid dilatancy; reddish oxidized parting; little medium to coarse SAND.		S10	25	18-24-51	75	18	15									
						26.5					77.4	22.8							
257.64	30		SILTY SAND (SM); dense; grayish brown; wet; fine to medium; interbedded with SILT; rapid dilatancy.		S11	30	13-15-16	31	18	17									
						31.5					20.7								
252.64	35		Poorly graded SAND (SP); medium dense; brown; wet; medium; subrounded; trace fines; rapid dilatancy.		S12	35	6-13-15	28	18	15									
						36.5													
			SANDY SILT (ML); very stiff; brown; wet; fine; slow dilatancy.		S13	36.5	10-15-19	34	18	18									
						38					71.5	25.8							
			SILTY SAND (SM); medium dense; reddish brown; wet; fine to medium; some SILT; rapid dilatancy.		S14	38	11-12-11	23	18	17									
						39.5					32.6/32.7	15.3							
247.64	40		SILTY SAND (SM); dense; reddish brown; wet; fine to		S15	39.5	9-13-19	32	18	15									

(continued)

REPORT TITLE BORING RECORD				HOLE ID S0006R	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME California High-Speed Train					
BRIDGE NUMBER		PREPARED BY D. Maggi/T. Curran		DATE 2-20-12	SHEET 2 of 5



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY N. Goodenow	BEGIN DATE Oct-13-11	COMPLETION DATE Oct-13-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2154688.474 / E6325497.455 (National Grid)		HOLE ID <b>S0006R</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. Selders			IN-SITU TESTING		SURFACE ELEVATION 287.64 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-81.5')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 3.75 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 81.5 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
40			medium; subangular to subrounded; trace GRAVEL; slow dilatancy; moderate cementation.			41					39.5	11.2							
242.64	45		Poorly graded SAND with SILT (SP-SM); medium dense; reddish brown; wet; medium; subangular to subrounded; little SILT; few GRAVEL; slow dilatancy; moderate cementation.		S16	45	8-12-14	26	18	13	10.6								
						46.5													
237.64	50		50.0', grayish brown; wet; fine to medium; subrounded; few GRAVEL; rapid dilatancy.		S17	50	11-13-13	26	18	14	6.4	14.2							
						51.5													
232.64	55		55.0', very dense; brown; wet; medium; subrounded; few fines; slow dilatancy.		S18	55	12-21-32	53	18	18									
						56.5													
227.64	60																		

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0006R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>3 of 5</b>	



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY N. Goodenow	BEGIN DATE Oct-13-11	COMPLETION DATE Oct-13-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2154688.474 / E6325497.455 (National Grid)		HOLE ID <b>S0006R</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. Selders			IN-SITU TESTING		SURFACE ELEVATION 287.64 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-81.5')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 3.75 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 81.5 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
60			Poorly graded SAND (SP); very dense; brown; wet; medium; subrounded; rapid dilatancy.	X	S19	60	45-75-63	138	18	13									
			SILTY SAND (SM); very dense; brown; fine; little SILT; slow dilatancy.			61.5													
222.64	65		65.0', reddish brown; fine to medium; subrounded; little fines.	X	S20	65	26-34-34	68	18	13									
						66.5													
217.64	70		70.0', medium; red horizontal partings.	X	S21	70	24-47-50	97	18	13									
						71.5													Red bedding 1/4 thick (horizontal bedding experienced at 70.67' to 70.75'; three well defined red hematite oxidation zones
212.64	75		SILT with SAND (ML); hard; brown; wet; subrounded to subangular; some fine SAND; low plasticity; medium dry strength; no dilatancy; low toughness.	X	S22	75	26-50	50/3"	9	9									
						76.5													PP: 1.0 tsf
207.64	80																		

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0006R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>4 of 5</b>	



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY N. Goodenow	BEGIN DATE Oct-13-11	COMPLETION DATE Oct-13-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2154688.474 / E6325497.455 (National Grid)		
DRILLING CONTRACTOR/DRILLER Gregg/D. Selders			IN-SITU TESTING		
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-81.5')			DRILL RIG Mobil B-80		
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			TOTAL DEPTH OF BORING 81.5 ft		
			GROUNDWATER DURING DRILLING AFTER DRILLING (DATE) READINGS Not Recorded Not Recorded		












Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
80			Grades red to brownish red.	X	S23	80	13-19-16	35	18	8									
			Poorly graded SAND (SP); dense; grayish brown; wet; medium.			81.5													
			Borehole terminated at a depth of 81.5' on 10/13/2011.																
			For corrosion test results, see Appendix E.																
			Soil moisture indicated as "wet" because SPT samples became wet during retrieval through rotary method drilling fluid. Soil moisture indication should not be used as an indication of a potential phreatic surface or free groundwater table.																
202.64	85		See Borehole Log Legend for soil classification chart and key to test data and sampler type.																
197.64	90																		
192.64	95																		
187.64	100																		

1.0.3 BOREHOLE LOG - CHSTP F-B CHSR F-B.GPJ ARUP DOTR LIBRARY.GLB 2/20/12



REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0006R</b>	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>					
BRIDGE NUMBER		PREPARED BY <b>D. Maggi/T. Curran</b>		DATE <b>2-20-12</b>	SHEET <b>5 of 5</b>

PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY N. Goodenow	BEGIN DATE Oct-14-11	COMPLETION DATE Oct-14-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2152086.945 / E6327473.995 (National Grid)		HOLE ID <b>S0007R</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. Selders			IN-SITU TESTING		SURFACE ELEVATION 285.11 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-81.5')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 3.75 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 81.5 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests	
	0		ASPHALT (6") (AC).		S01	0			60	60										Hand auger to 5.0' to confirm no utilities
			AGGREGATE BASE (6") (AB).																	
			SILTY SAND (SM); medium dense; brown; moist; medium; subrounded; few fine GRAVEL; rapid dilatancy; no cementation; [FILL].								30.8									
280.11	5		Poorly graded SAND with SILT (SP-SM); very dense; brown to reddish brown; wet; fine; little SILT; few coarse SAND; slow dilatancy; moderate cementation; calcite layers 1/2 to 3/4" thick [ALLUVIUM].			5														
			5.0' - 6.3', calcite seams.		S02	5	52-96-50	146/9"	15	15										
						6.5					32.6	10.3								
			7.0', grades dense; without calcite; weak cementation.		S03	6.5	21-42-70	112	18	17										
						8					37.2	11.1								
					S04	8	23-31-18	49	18	17										
						9.5														
275.11	10		9.5', grades medium dense.		S05	9.5	6-7-10	17	18	13	30.9	13.6								
						11														
			11.0', grades dense; frequent calcite seams.		S06	11	8-21-19	40	18	13										
						12.5														
			12.2' - 14.0', calcite seams.		S07	12.5	7-10-21	31	18	14										
						14					30.4	19.9								
			14.0', grades very dense.		S08	14	17-37-34	71	18	15										
270.11	15					15.5					40.7	14.1								
																			</	

(continued)

REPORT TITLE BORING RECORD				HOLE ID S0007R	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME California High-Speed Train					
BRIDGE NUMBER		PREPARED BY D. Maggi/T. Curran		DATE 2-20-12	SHEET 1 of 5



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY N. Goodenow	BEGIN DATE Oct-14-11	COMPLETION DATE Oct-14-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2152086.945 / E6327473.995 (National Grid)		HOLE ID <b>S0007R</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. Selders			IN-SITU TESTING		SURFACE ELEVATION 285.11 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-81.5')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 3.75 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 81.5 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
20			SILTY SAND (SM); medium dense; grayish brown; fine to medium; rounded to subrounded; few SILT; rapid dilatancy; weak cementation.		S09	20	5-7-8	15	18	13									
			21.5', some SILT.			21.5					7.4								
											30.4								
260.11	25		25.0', grades dense.		S10	25	18-13-17	30	18	14									
						26.5													
			SILTY SAND (SM); dense; olive brown; wet; fine; some SILT; slow dilatancy.																
255.11	30		SILT with SAND (ML); hard; olive brown; wet; little SAND; slow dilatancy.		S11	30	7-11-30	41	18	17									
			SILTY SAND (SM); dense; brown; wet; fine to medium; subrounded; some SILT; slow dilatancy; reddish brown oxidation seams.			31.5					84.2	29.7							
											43.9	14.1							
250.11	35		35.0', brown to reddish brown; fine SAND; weak cementation.		S12	35	12-12-15	27	18	14									
						36.5					30.5								

(continued)

REPORT TITLE BORING RECORD				HOLE ID S0007R	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME California High-Speed Train					
BRIDGE NUMBER		PREPARED BY D. Maggi/T. Curran		DATE 2-20-12	SHEET 2 of 5





PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY N. Goodenow	BEGIN DATE Oct-14-11	COMPLETION DATE Oct-14-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2152086.945 / E6327473.995 (National Grid)		HOLE ID <b>S0007R</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. Selders			IN-SITU TESTING		SURFACE ELEVATION 285.11 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-81.5')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 3.75 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
			TOTAL DEPTH OF BORING 81.5 ft		

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
40					S13	40	8-16-24	40	18	17									PP: 3.25 tsf TV: 5.0 tsf
			SILTY CLAY with SAND (CL); hard; reddish brown; wet; some SILT; some SAND; medium plasticity; medium dry strength; low toughness.			41.5					74.8	17.8	41	26					
240.11	45				S14	45	8-12-17	29	18	15									PP: 1.5 tsf TV: 2.0 tsf
			SANDY SILT (ML); very stiff; reddish brown and grayish brown; some fine SAND; weak cementation.			46.5					68.2	28.6							
235.11	50				S15	50	9-12-12	24	18	18									
			SILTY SAND (SM); medium dense; brown; wet; fine to medium; subangular; some SILT; weak cementation.			51.5					17.6								
230.11	55				S16	55	5-7-11	18	18	18									
			SANDY SILT (ML); very stiff; light brown; wet; some fine SAND; slow dilatancy; weak cementation.			56.5					59.5								
225.11	60																		

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0007R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>3 of 5</b>	





PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>			
LOGGED BY N. Goodenow		BEGIN DATE Oct-14-11	COMPLETION DATE Oct-14-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2152086.945 / E6327473.995 (National Grid)		HOLE ID <b>S0007R</b>	
DRILLING CONTRACTOR/DRILLER Gregg/D. Selders				IN-SITU TESTING		SURFACE ELEVATION 285.11 ft (NAVD88)	
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-81.5')				DRILL RIG Mobil B-80		BOREHOLE DIAMETER 3.75 in	
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")				SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%	
BOREHOLE BACKFILL AND COMPLETION Neat cement grout				GROUNDWATER DURING DRILLING READINGS Not Recorded		AFTER DRILLING (DATE) Not Recorded	
						TOTAL DEPTH OF BORING 81.5 ft	

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
60			SILTY SAND (SM); dense; brown; wet; fine; some SILT; stratified with interbedding of SILT; no dilatancy; weak cementation.		S17	60	18-14-24	38	18	18									
						61.5					41	17.5							
220.11	65		SANDY SILT (ML); hard; reddish brown; wet; subangular; some SAND; trace fine GRAVEL; mottled hematite staining.		S18	65	13-20-28	48	18	18									
						66.5					50.1	17.9							
215.11	70				S19	70	6-14-25	39	18	18									
						71.5													
210.11	75		75.0' brown; reddish brown subhorizontal seams of oxidation staining; no dilatancy; weak cementation.		S20	75	16-20-50	70	18	14									
						76.5					51.5	22.4							
205.11	80																		

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0007R</b>	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>					
BRIDGE NUMBER		PREPARED BY <b>D. Maggi/T. Curran</b>		DATE <b>2-20-12</b>	SHEET <b>4 of 5</b>



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY N. Goodenow	BEGIN DATE Oct-14-11	COMPLETION DATE Oct-14-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2152086.945 / E6327473.995 (National Grid)		HOLE ID <b>S0007R</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. Selders			IN-SITU TESTING		SURFACE ELEVATION 285.11 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-81.5')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 3.75 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 81.5 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
80			SILT with SAND (ML); hard; light olive brown; wet; fine; frequent dark reddish brown seams; weak cementation.	X	S21	80	29-50-67	117	18	13									
						81.5					77.3	29.3							
<p>Borehole terminated at a depth of 81.5' on 10/14/2011.</p> <p>For corrosion test results, see Appendix E.</p> <p>Soil moisture indicated as "wet" because SPT samples became wet during retrieval through rotary method drilling fluid. Soil moisture indication should not be used as an indication of a potential phreatic surface or free groundwater table.</p> <p>See Borehole Log Legend for soil classification chart and key to test data and sampler type.</p>																			



REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0007R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>5 of 5</b>	

PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY N. Goodenow	BEGIN DATE Oct-17-11	COMPLETION DATE Oct-19-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2150921.784 / E6328341.737 (National Grid)		HOLE ID <b>S0010R</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. Selders			IN-SITU TESTING Standpipe Piezometer; PS Logging		SURFACE ELEVATION 286.12 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-165')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 3.75 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Piezometer			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
			TOTAL DEPTH OF BORING 165 ft		

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	0		ASPHALT (8") (AC).		S01	0			60	60									Hand auger to 5.0'
			AGGREGATE BASE (4") (AB).																
			SILTY SAND (SM); brown; moist; fine to medium; rapid dilatancy; [FILL].								22.3								
281.12	5				S02	5	5-7-11	18	18	18									
			SILTY SAND (SM); medium dense; brown; moist; fine to medium; [ALLUVIUM].			6.5					24.4	4.8							
			SANDY SILT (ML); hard; grayish brown; wet; fine; low plasticity; slow dilatancy; weak cementation. Grades wet.		S03	6.5	10-21-27	48	18	17									
						8													
					S04	8	10-19-24	43	18	17									
						9.5					57	15.9							
276.12	10		SANDY SILTY CLAY (CL-ML); hard; brown; wet; low plasticity; slow dilatancy.		S05	9.5	14-20-24	44	18	17									
						11					52.9		27	5	3.2				
			SILTY SAND (SM); medium dense; brown; wet; fine; some SILT.		S06	11	5-7-10	17	18	17									
						12.5					41.7	16.4							
			SANDY SILTY CLAY (CL-ML); hard; grayish brown; wet; fine SAND; low plasticity; fine; mottled grayish brown and brown.		S07	12.5	14-25-24	49	18	15									
						14					58.9/15.2		29	7	1.5				
271.12	15		14.0', grades brownish gray.		S08	14	10-13-16	29	18	15									
						15.5													

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0010R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>1 of 9</b>	



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY N. Goodenow	BEGIN DATE Oct-17-11	COMPLETION DATE Oct-19-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2150921.784 / E6328341.737 (National Grid)		HOLE ID <b>S0010R</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. Selders			IN-SITU TESTING Standpipe Piezometer; PS Logging		SURFACE ELEVATION 286.12 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-165')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 3.75 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Piezometer			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 165 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
20			SILTY SAND (SM); medium dense; grayish brown and brown; wet; medium; subrounded; trace GRAVEL; slow dilatancy; stratified; interbedded reddish brown oxidation stained pockets.	S09	20	21.5	9-11-13	24	18	16	36.5/57.1	16.9							
261.12	25		SILT (ML); very stiff; grayish brown; wet; trace SAND; medium plasticity; medium dry strength; low toughness.	S10	25	26.5	11-15-18	33	18	18	94.6	30.8	35	10					
256.12	30		SILTY SAND (SM); medium dense; brownish gray; wet; fine to medium; subrounded; rapid dilatancy; primarily quartz, muscovite, and trace mafic minerals.	S11	30	31.5	7-9-10	19	18	16	23.7	20.9							
251.12	35			S12	35	36.5	9-10-11	21	18	17	22.7/15.2	17.4							
246.12	40																		

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0010R</b>	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>					
BRIDGE NUMBER		PREPARED BY <b>D. Maggi/T. Curran</b>		DATE <b>2-20-12</b>	SHEET <b>2 of 9</b>



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY N. Goodenow	BEGIN DATE Oct-17-11	COMPLETION DATE Oct-19-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2150921.784 / E6328341.737 (National Grid)		HOLE ID <b>S0010R</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. Selders			IN-SITU TESTING Standpipe Piezometer; PS Logging		SURFACE ELEVATION 286.12 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-165')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 3.75 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Piezometer			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 165 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	40		Poorly graded SAND with SILT (SP-SM); dense; reddish brown; wet; medium; subrounded; trace gravel; slow dilatancy.	S13	40	13-19-17	36	18	17		6.7								
						41.5													
241.12	45		SANDY CLAY (CL); hard; reddish brown; wet; fine; trace organic; medium plasticity; slow dilatancy.	S14	45	11-20-25	45	18	16		50.3	15.2 15.7	24	10	3.1				
						46.5													
236.12	50		CLAY with SAND (CL); hard; grayish brown; wet; fine; trace organic; low plasticity; slow dilatancy.	S15	50	13-16-19	35	18	16		75.1		30	9	1.5				
						51.5													
231.12	55		55.0', brownish gray; medium plasticity; medium dry strength; medium toughness; frequent reddish brown oxidation.	S16	55	8-13-23	36	18	18		78.3	31.7	41	17					PP: 1.0 tsf TV: 2.5 tsf
						56.5													
226.12	60																		

(continued)

REPORT TITLE BORING RECORD				HOLE ID S0010R	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME California High-Speed Train					
BRIDGE NUMBER		PREPARED BY D. Maggi/T. Curran		DATE 2-20-12	SHEET 3 of 9



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY N. Goodenow	BEGIN DATE Oct-17-11	COMPLETION DATE Oct-19-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2150921.784 / E6328341.737 (National Grid)		HOLE ID <b>S0010R</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. Selders			IN-SITU TESTING Standpipe Piezometer; PS Logging		SURFACE ELEVATION 286.12 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-165')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 3.75 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Piezometer			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 165 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
60			SANDY CLAY (CL); very stiff; olive brown; wet; fine; low plasticity; rapid dilatancy.		S17	60	6-11-14	25	18	16									
						61.5					64.5	23	25	8	1.9				
221.12	65		65 reddish brown; medium; subrounded; stratified to laminated; medium plasticity; medium dry strength; slow dilatancy; low toughness.		S18	65	9-10-13	23	18	17									
						66.5					63.5	21.7	43	26	5.8				
216.12	70		70.0', grades hard.		S19	70	13-17-18	35	18	15									
						71.5													
211.12	75		SILTY SAND (SM); dense; light brown; wet; fine to medium; interbedded with SILT; hard, brownish gray, wet; low plasticity; low dry strength; low toughness.		S20	75	18-24-24	48	18	15									
						76.5													
206.12	80																		

(continued)

REPORT TITLE BORING RECORD				HOLE ID S0010R	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME California High-Speed Train					
BRIDGE NUMBER		PREPARED BY D. Maggi/T. Curran		DATE 2-20-12	SHEET 4 of 9



1.0.3 BOREHOLE LOG - CHSTP F-B CHSR F-B.GPJ ARUP DOTR LIBRARY.GLB 2/20/12

(continued)



URS | HMM | ARUP  
CALIFORNIA HIGH-SPEED TRAIN

PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY N. Goodenow	BEGIN DATE Oct-17-11	COMPLETION DATE Oct-19-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2150921.784 / E6328341.737 (National Grid)		HOLE ID <b>S0010R</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. Selders			IN-SITU TESTING Standpipe Piezometer; PS Logging		SURFACE ELEVATION 286.12 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-165')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 3.75 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Piezometer			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
			TOTAL DEPTH OF BORING 165 ft		

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
100			Poorly graded SAND with SILT (SP-SM); medium dense; gray; wet; medium; subrounded; trace SILT.		S25	100	15-19-16	35	18	15									
						101.5					13.9	18.9							
181.12	105		SILT with SAND (ML); hard; grayish brown; wet; low plasticity; low dry strength; slow dilatancy; low toughness.		S26	105	25-33-59	92	18	17									
						106.5					77.1								
176.12	110		SILTY SAND (SM); dense; brown to dark brown; wet; fine; subangular; little SILT; trace coarse SAND; slow dilatancy.		S27	110	15-21-22	43	18	18									
						111.5					31.9								
171.12	115		115.0', grades medium dense; brown.		S28	115	11-15-20	35	18	18									
						116.5													
166.12	120																		

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0010R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>6 of 9</b>	





PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY N. Goodenow	BEGIN DATE Oct-17-11	COMPLETION DATE Oct-19-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2150921.784 / E6328341.737 (National Grid)		HOLE ID <b>S0010R</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. Selders			IN-SITU TESTING Standpipe Piezometer; PS Logging		SURFACE ELEVATION 286.12 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-165')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 3.75 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Piezometer			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 165 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
120			SAND with SILT (SP-SM); very dense; grayish brown; wet; fine; few fines; variegated with dark brown coloring; reddish brown oxidation staining.	S29	120	120	15-22-35	57	18	16									
						121.5													
161.12	125		SILT with SAND (ML); hard; brownish gray; wet; low plasticity; medium dry strength; low toughness; variegated with brown partings.	S30	125	125	38-68-50	118/8"	14	14									
						126.5						70	36.9	44	12				
156.12	130		SILTY SAND (SM); very dense; brownish gray; wet; fine.	S31	130	130	20-28-27	55	18	18									
						131.5						46.3							
151.12	135		Poorly graded SAND (SP); very dense; light grayish brown; wet; fine; trace fines; rapid dilatancy.	S32	135	135	25-34-47	81	18	18									
						136.5													
146.12	140																		

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0010R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>7 of 9</b>	



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY N. Goodenow	BEGIN DATE Oct-17-11	COMPLETION DATE Oct-19-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2150921.784 / E6328341.737 (National Grid)		HOLE ID <b>S0010R</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. Selders			IN-SITU TESTING Standpipe Piezometer; PS Logging		SURFACE ELEVATION 286.12 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-165')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 3.75 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Piezometer			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
			TOTAL DEPTH OF BORING 165 ft		

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
140			CLAYEY SAND (SC); very dense; brownish gray; wet; fine; little CLAY; no dilatancy; variegated dark yellowish brown parting oxidations.	S33	140	140	37-48-50	98/9	15	15									
						141.5													
141.12	145		Poorly graded SAND (SP); dense; light olive brown; wet; medium; subrounded.	S34	145	145	15-15-17	32	18	17									
						146.5													
136.12	150		SILTY SAND (SM); very dense; light brown; wet; fine; some SILT; slow dilatancy.	S35	150	150	17-32-36	68	18	18									
						151.5					30.8	36.8							
131.12	155																		
126.12	160																		Created a rat hole down to 165.0'

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0010R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>8 of 9</b>	



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY N. Goodenow	BEGIN DATE Oct-17-11	COMPLETION DATE Oct-19-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2150921.784 / E6328341.737 (National Grid)		HOLE ID <b>S0010R</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. Selders			IN-SITU TESTING Standpipe Piezometer; PS Logging		SURFACE ELEVATION 286.12 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-165')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 3.75 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Piezometer			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
			TOTAL DEPTH OF BORING 165 ft		

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
160																			
121.12	165		Borehole terminated at a depth of 165.0' on 10/19/2011. Overdrilled hole to 165.0' for PS Logging.																
			For corrosion test results, see Appendix E.																
			Soil moisture indicated as "wet" because SPT samples became wet during retrieval through rotary method drilling fluid. Soil moisture indication should not be used as an indication of a potential phreatic surface or free groundwater table.																
116.12	170		See Borehole Log Legend for soil classification chart and key to test data and sampler type.																
111.12	175																		
106.12	180																		



REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0010R</b>	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>					
BRIDGE NUMBER		PREPARED BY <b>D. Maggi/T. Curran</b>		DATE <b>2-20-12</b>	SHEET <b>9 of 9</b>



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY N. Goodenow	BEGIN DATE Oct-24-11	COMPLETION DATE Oct-25-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2148215.466 / E6330773.973 (National Grid)		HOLE ID <b>S0012R</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. Selders			IN-SITU TESTING PS Logging		SURFACE ELEVATION 287.57 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-165')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 6.25 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 165 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	20		SILT (ML); very stiff; brownish gray.		S09	20	10-14-16	30	18	17	97.3	33.2							
			SILTY SAND (SM); dense; brown; wet; mostly fine; some SILT; slow dilatancy.			21.5					68.4								
262.57	25		SILTY SAND (SM); medium dense; grayish brown to gray mottled with brown; wet; mostly fine; little SILT; slow dilatancy; dark brown hydrocarbon contamination along 1-inch thick seam in 2 locations.		S10	25	9-8-18	26	18	18									Hydro-carbon contamination. Strong smell and easily visible.
						26.5													
257.57	30		30' grades to dense; gray to grayish brown; rapid dilatancy.		S11	30	8-11-24	35	18	18									Hydro-carbon contamination.
						31.5													
252.57	35		Poorly-graded SAND with SILT (SP-SM); medium dense; light brownish gray; wet; medium; rapid dilatancy.		S12	35	8-9-11	20	18	15	6.8								
						36.5													
247.57	40																		

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0012R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>2 of 9</b>	



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY N. Goodenow	BEGIN DATE Oct-24-11	COMPLETION DATE Oct-25-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2148215.466 / E6330773.973 (National Grid)		HOLE ID <b>S0012R</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. Selders			IN-SITU TESTING PS Logging		SURFACE ELEVATION 287.57 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-165')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 6.25 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 165 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	40		SILTY SAND (SM); medium dense; light brownish gray; wet; medium; some fines; rapid dilatancy.		S13	40	12-12-15	27	18	17		26.3							
						41.5													
242.57	45		Poorly-graded SAND with SILT (SP-SM); medium dense; light brownish gray; wet; medium; little SILT; rapid dilatancy.		S14	45	9-11-12	23	18	17		14	14.8						
						46.5													
237.57	50		SILTY SAND (SM); medium dense; reddish brown; wet; fine to medium; subrounded; little SILT; trace GRAVEL; slow dilatancy.		S15	50	17-22-28	50	18	18		48.5	18.5						
						51.5													
232.57	55		Poorly-graded SAND with SILT (SP-SM); dense; reddish brown; wet; mostly medium grained sand; trace fines; rapid dilatancy; mostly quartz, muscovite and a mafic material.		S16	55	16-19-23	42	18	17		8.1							
						56.5													
227.57	60																		

(continued)

REPORT TITLE BORING RECORD				HOLE ID S0012R	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME California High-Speed Train					
BRIDGE NUMBER		PREPARED BY D. Maggi/T. Curran		DATE 2-20-12	SHEET 3 of 9



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY N. Goodenow	BEGIN DATE Oct-24-11	COMPLETION DATE Oct-25-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2148215.466 / E6330773.973 (National Grid)		HOLE ID <b>S0012R</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. Selders			IN-SITU TESTING PS Logging		SURFACE ELEVATION 287.57 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-165')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 6.25 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 165 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
60			Poorly-graded SAND with SILT (SP-SM); dense; reddish brown; wet; mostly medium; trace fines; rapid dilatancy; mostly quartz, muscovite and a mafic mineral..		S17	60	15-17-17	34	18	16									
						61.5					6.4								
222.57	65		Poorly graded SAND (SP); dense; reddish brown; wet; mostly medium; trace fines; rapid dilatancy; mostly quartz, muscovite and a mafic mineral..		S18	65	14-20-24	44	18	18									
						66.5													
217.57	70		Sandy SILT (ML); very dense; reddish brown reddish brown; subrounded; some SAND; slow dilatancy; weak cementation; few dark mafic partings.		S19	70	16-27-30	57	18	18									
						71.5					50.1	16.2							
212.57	75		SILTY SAND (SM); very dense; multicolored brownish red light brown, gray and brown; wet; mostly fine; some SILT; trace fine GRAVEL; black oxidation partings along fissures.		S20	75	42-50	50/ 3"	9	9									
						76.5					28.8	24.6							
207.57	80																		

(continued)

REPORT TITLE BORING RECORD				HOLE ID S0012R	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME California High-Speed Train					
BRIDGE NUMBER		PREPARED BY D. Maggi/T. Curran		DATE 2-20-12	SHEET 4 of 9





PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY N. Goodenow	BEGIN DATE Oct-24-11	COMPLETION DATE Oct-25-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2148215.466 / E6330773.973 (National Grid)		HOLE ID <b>S0012R</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. Selders			IN-SITU TESTING PS Logging		SURFACE ELEVATION 287.57 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-165')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 6.25 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 165 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
80			SILT with SAND (ML); hard; multicolored brownish brown; wet; some SAND; reddish seams.		S21	80	20-35-49	84	18	15	74	29.3							
						81.5													
202.57	85		SILTY SAND (SM); very dense; grayish brown; wet; fine; little SILT; slow dilatancy.		S22	85	16-34-62	96	18	16	73.8								
			SILT with SAND (ML); hard; brownish gray; wet; mostly SILT; low plasticity; low dry strength; low toughness; reddish brown oxidation seams in multiple locations.			86.5													
197.57	90		SILTY SAND (SM); dense; grayish brown; little SILT; slow dilatancy.		S23	90	14-12-24	36	18	18	16.2	30.1							
						91.5													
192.57	95		SANDY SILT (ML); hard; grayish brown; wet; some SAND; low plasticity; low dry strength; low toughness.		S24	95	17-30-52	82	18	16	67.8								
						96.5													
187.57	100																		

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0012R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>5 of 9</b>	





PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY N. Goodenow	BEGIN DATE Oct-24-11	COMPLETION DATE Oct-25-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2148215.466 / E6330773.973 (National Grid)		HOLE ID <b>S0012R</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. Selders			IN-SITU TESTING PS Logging		SURFACE ELEVATION 287.57 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-165')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 6.25 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 165 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
100			SILTY SAND (SM); very dense; grayish brown; wet; some SILT; slow dilatancy; interbedded; variegated dark brown parting.		S25	100	13-30-100	130/10"	16	14									
						101.5													
182.57	105		SILT with SAND (ML); very stiff; grayish brown; wet; some SAND; slow dilatancy; slow dilatancy.		S26	105	14-14-13	27	18	18									
						106.5					79.4	29.9							
177.57	110		110' grades to hard; grayish brown to reddish brown; wet; mostly medium.		S27	110	24-25-56	81	18	18									
						111.5					73.3								
172.57	115		SILTY SAND (SM); medium dense; brown; wet; mostly medium; subangular; little fine SAND; little coarse SAND; trace GRAVEL; rapid dilatancy; weak cementation.		S28	115	9-11-15	26	18	18									
						116.5					29.8								
167.57	120																		

(continued)

1.0.3 BOREHOLE LOG - CHSTP F-B CHSR F-B.GPJ ARUP DOTR LIBRARY.GLB 2/20/12



REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0012R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>6 of 9</b>	

PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY N. Goodenow	BEGIN DATE Oct-24-11	COMPLETION DATE Oct-25-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2148215.466 / E6330773.973 (National Grid)		HOLE ID <b>S0012R</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. Selders			IN-SITU TESTING PS Logging		SURFACE ELEVATION 287.57 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-165')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 6.25 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
			TOTAL DEPTH OF BORING 165 ft		

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
120			SILTY SAND (SM); very dense; wet; fine to coarse SAND; rapid dilatancy; moderate cementation in the last 3 inches.	S29	120	120	16-16-34	50	18	18									
						121.5													
162.57	125		125' grades to fine; slow dilatancy; (2-inch thick layer containing very dense; reddish brown silty sand from 126.0' to 126.2').	S30	125	125	19-29-49	78	18	18									
						126.5						30.7	43.5						
157.57	130		129' grades to dense; light brownish gray; rapid dilatancy; light gray seam 1/4-inch thick.	S31	130	130	18-17-20	37	18	15									
			Poorly graded SAND (SP); dense; light brownish gray; wet; medium; subrounded; few fines; rapid dilatancy.			131.5													
152.57	135		Sandy SILT (ML); very dense; brownish gray; wet; fine; interbedded with grayish brown, hard, wet; non-plastic; medium toughness.	S32	135	135	19-27-23	50	18	17									
			135.8', olive brown; wet; medium to fine; subrounded; few coarse SAND; rapid dilatancy.			136.5						56.9	27.2						
147.57	140		SILT (ML); hard; light brownish gray; wet; little CLAY; some fine SAND; medium plasticity; medium dry																PP: 1.5 tsf TV: 1.0 tsf

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0012R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>7 of 9</b>	



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY N. Goodenow	BEGIN DATE Oct-24-11	COMPLETION DATE Oct-25-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2148215.466 / E6330773.973 (National Grid)		HOLE ID <b>S0012R</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. Selders			IN-SITU TESTING PS Logging		SURFACE ELEVATION 287.57 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-165')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 6.25 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 165 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	140		strength; medium toughness; mottled with dark reddish brown oxidation staining.		S33	140	19-27-37	64	18	17									
						141.5					86.5	32.8	40	10					
	142.57		SILTY SAND (SM); dense; olive brown; wet; fine; some SILT; slow dilatancy; mottled with reddish brown oxidation partings.		S34	145	17-22-25	47	18	16									
						146.5													
	137.57		Sandy SILT (ML); hard; grayish brown; wet; some SAND; slow dilatancy.		S35	150	9-10-15	25	18	17									
						151.5					61.8	36							
	132.57																		
	127.57																		

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0012R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>8 of 9</b>	



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY N. Goodenow	BEGIN DATE Oct-24-11	COMPLETION DATE Oct-25-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2148215.466 / E6330773.973 (National Grid)		HOLE ID <b>S0012R</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. Selders			IN-SITU TESTING PS Logging		SURFACE ELEVATION 287.57 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-165')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 6.25 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING <b>165 ft</b>

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
160																			
122.57	165																		
117.57	170																		
112.57	175																		
107.57	180																		

Borehole terminated at a depth of 165.0' on 10/25/2011. Overdrilled hole to 165.0' for PS Logging.

For corrosion test results, see Appendix E.

Soil moisture indicated as "wet" because SPT samples became wet during retrieval through rotary method drilling fluid. Soil moisture indication should not be used as an indication of a potential phreatic surface or free groundwater table.

See Borehole Log Legend for soil classification chart and key to test data and sampler type.

1.0.3 BOREHOLE LOG - CHSTP F-B CHSR F-B.GPJ ARUP DOTR LIBRARY.GLB 2/20/12



REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0012R</b>	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>					
BRIDGE NUMBER		PREPARED BY <b>D. Maggi/T. Curran</b>		DATE <b>2-20-12</b>	SHEET <b>9 of 9</b>

PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY A. Poling	BEGIN DATE Oct-19-11	COMPLETION DATE Oct-20-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2146714.433 / E6332311.651 (National Grid)		HOLE ID <b>S0013AR</b>
DRILLING CONTRACTOR/DRILLER Pitcher/W. Baker			IN-SITU TESTING Standpipe piezometer		SURFACE ELEVATION 286.05 ft (NAVD88)
DRILLING METHOD AUGER(0'-6.5'), ROTARY(6.5'-151.5')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Piezometer			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
			TOTAL DEPTH OF BORING 151.5 ft		

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	0		Poorly graded SAND (SP); brown; moist to dry; trace SILT; fine medium SAND; trace coarse SAND; weak cementation.		S01	0			60	60									1" concrete pavement; garbage barrel
											48.3								Modified Proctor: Max $\gamma_d = 125.5$ pcf Optimum $W_L = 9.8\%$
			4.0', ceramic and glass debris in cuttings.			5													
281.05	5		Poorly graded SAND (SP); very dense; reddish brown; moist to dry; trace SILT; fine medium SAND; trace coarse SAND; weak cementation.		S02	5	26-26-50	76/11"	17	16									
			Poorly graded SAND with SILT (SP-SM); very dense; grayish brown with reddish brown mottling; moist; few SILT; fine SAND; trace coarse SAND; weak cementation.		S03	6.5	26-19-12	31	18	14		30.8	10.1						6.5' mud tub set; 6" drag bit
			Poorly graded SAND (SP); dense; reddish brown; wet; trace SILT; fine medium SAND; weak cementation.		S04	8	37-50	50/3"	9	9		28.3	12						
						9.5													
276.05	10		9.5', SP-SM - refer to 5.8', grades to wet brown with reddish brown mottling.		S05	9.5	46-50	50/6"	12	12		65.8	23.8						
						11													
			11.0', SP - refer to 6.5'.		S06	11	18-34-27	61	18	14		47.1	16.3						
			11.7', SP-SM refer to 5.8', grades to wet.			12.5						65.4							
			12.5', grades to dense; grayish brown with grayish-white mottling. All the fine content suggests SILT.		S07	12.5	21-18-19	37	18	12		75.1	18.5						
						14													
271.05	15		14.0', grades to medium dense; grayish brown with reddish brown and gray mottling.		S08	14	14-11-11	22	18	12		73.9	16.2						
						15.5													

(continued)

1.0.3 BOREHOLE LOG - CHSTP F-B CHSR F-B.GPJ ARUP DOTR LIBRARY.GLB 2/20/12



REPORT TITLE BORING RECORD				HOLE ID S0013AR	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME California High-Speed Train					
BRIDGE NUMBER		PREPARED BY D. Maggi/T. Curran		DATE 2-20-12	SHEET 1 of 8

PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY A. Poling	BEGIN DATE Oct-19-11	COMPLETION DATE Oct-20-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2146714.433 / E6332311.651 (National Grid)		HOLE ID <b>S0013AR</b>
DRILLING CONTRACTOR/DRILLER Pitcher/W. Baker			IN-SITU TESTING Standpipe piezometer		SURFACE ELEVATION 286.05 ft (NAVD88)
DRILLING METHOD AUGER(0'-6.5'), ROTARY(6.5'-151.5')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Piezometer			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
			TOTAL DEPTH OF BORING 151.5 ft		

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	20		20.0', grades to dense; grayish brown with brown mottling.		S09	20	21-18-28	46	18	16	76.5								
261.05	25		25.0', grades to grayish brown with reddish brown, brown, and grayish white mottling.		S10	25	16-18-16	34	18	14	78.6	24.5							
						26.5													
						28													
256.05	30		30.0', grades to grayish brown with frequent reddish brown mottling.		S11	30	13-14-20	34	18	18	62.4	21.7							
						31.5													
251.05	35		35.0', grades to very dense; reddish brown.		S12	35	20-25-31	56	18	18	67.6								
			36.0', grades to grayish brown with reddish brown mottling.			36.5													
246.05	40																		

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0013AR</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>2 of 8</b>	



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY A. Poling	BEGIN DATE Oct-19-11	COMPLETION DATE Oct-20-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2146714.433 / E6332311.651 (National Grid)		HOLE ID <b>S0013AR</b>
DRILLING CONTRACTOR/DRILLER Pitcher/W. Baker			IN-SITU TESTING Standpipe piezometer		SURFACE ELEVATION 286.05 ft (NAVD88)
DRILLING METHOD AUGER(0'-6.5'), ROTARY(6.5'-151.5')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Piezometer			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
			TOTAL DEPTH OF BORING 151.5 ft		

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	40		40.0', grades to dense; reddish brown with grayish brown mottling.		S13	40	39-18-18	36	18	18									
						41.5					84.7	26.6							
241.05	45		Poorly graded SAND (SP); very dense; brown with reddish brown mottling; wet; trace SILT; fine SAND; weak cementation.		S14	45	29-50	50/5.5"	12	11									
						46.5					38	15							
236.05	50		50.0', grades to reddish brown; fine to medium SAND; trace coarse SAND.		S15	50	18-28-33	61	18	16									
						51.5													
231.05	55		Poorly graded SAND with SILT (SP-SM); dense; grayish brown with reddish brown mottling; few SILT; fine SAND; weak cementation.		S16	55	10-19-22	41	18	14									
						56.5					77								
226.05	60																		

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0013AR</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>3 of 8</b>	



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY A. Poling	BEGIN DATE Oct-19-11	COMPLETION DATE Oct-20-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2146714.433 / E6332311.651 (National Grid)		HOLE ID <b>S0013AR</b>
DRILLING CONTRACTOR/DRILLER Pitcher/W. Baker			IN-SITU TESTING Standpipe piezometer		SURFACE ELEVATION 286.05 ft (NAVD88)
DRILLING METHOD AUGER(0'-6.5'), ROTARY(6.5'-151.5')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Piezometer			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
			TOTAL DEPTH OF BORING 151.5 ft		

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
60			60.0', grades to very dense.		S17	60	12-26-27	53	18	14	71.8	24.3							
						61.5													
221.05	65		Poorly graded SAND (SP); dense; brown with reddish brown mottling; trace SILT; fine to medium SAND; weak cementation.		S18	65	12-19-26	45	18	12									
						66.5													
216.05	70		70.0', grades to very dense; reddish brown; medium-fine SAND.		S19	70	21-29-34	63	18	18	19.4								
						71.5													
211.05	75				S20	75	11-20-31	51	18	18									
						76.5													
206.05	80																		

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0013AR</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>4 of 8</b>	





PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY A. Poling	BEGIN DATE Oct-19-11	COMPLETION DATE Oct-20-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2146714.433 / E6332311.651 (National Grid)		HOLE ID <b>S0013AR</b>
DRILLING CONTRACTOR/DRILLER Pitcher/W. Baker			IN-SITU TESTING Standpipe piezometer		SURFACE ELEVATION 286.05 ft (NAVD88)
DRILLING METHOD AUGER(0'-6.5'), ROTARY(6.5'-151.5')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Piezometer			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
			TOTAL DEPTH OF BORING 151.5 ft		

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
80			Poorly graded SAND with SILT (SP-SM); very dense; grayish brown with reddish brown mottling; wet; few SILT; fine SAND; weak cementation.	X	S21	80	29-50	50/ 5.5"	12	10									
						81.5					60.6	23							
201.05	85		85.0', grades to brown.	X	S22	85	31-31-44	75	18	17									
						86.5													
196.05	90		Poorly graded SAND (SP); dense; brown; wet; trace SILT; fine medium SAND; weak cementation.	X	S23	90	11-14-56	70	18	7									
						91.5													
191.05	95		SILTY SAND (SM); very dense; grayish brown; wet; little SILT; trace medium fine SAND; weak cementation.	X	S24	95	32-50	50/ 4"	10	9									
						96.5					90.9								
186.05	100																		

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0013AR</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>5 of 8</b>	



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY A. Poling	BEGIN DATE Oct-19-11	COMPLETION DATE Oct-20-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2146714.433 / E6332311.651 (National Grid)		HOLE ID <b>S0013AR</b>
DRILLING CONTRACTOR/DRILLER Pitcher/W. Baker			IN-SITU TESTING Standpipe piezometer		SURFACE ELEVATION 286.05 ft (NAVD88)
DRILLING METHOD AUGER(0'-6.5'), ROTARY(6.5'-151.5')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Piezometer			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
			TOTAL DEPTH OF BORING 151.5 ft		

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
100			Poorly graded SAND (SP); very dense; brown; wet; trace SILT; medium fine SAND; weak cementation.		S25	100	17-20-30	50	18	15									
						101.5													
181.05	105		105.0', grades to weak moderate cementation.		S26	105	29-50	50/ 6"	12	11									
						106.5					34.4	17.4							
176.05	110		110.0', grades to medium dense fine SAND.		S27	110	12-12-17	29	18	15									
						111.5					67.1								
171.05	115		Poorly graded SAND with SILT (SP-SM); very dense; grayish brown with brown mottling; few SILT; fine SAND; weak cementation.		S28	115	42-50	50/ 3"	9	11									
						116.5					54.3	26.8							

(continued)

REPORT TITLE BORING RECORD				HOLE ID S0013AR	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME California High-Speed Train					
BRIDGE NUMBER		PREPARED BY D. Maggi/T. Curran		DATE 2-20-12	SHEET 6 of 8



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY A. Poling	BEGIN DATE Oct-19-11	COMPLETION DATE Oct-20-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2146714.433 / E6332311.651 (National Grid)		HOLE ID <b>S0013AR</b>
DRILLING CONTRACTOR/DRILLER Pitcher/W. Baker			IN-SITU TESTING Standpipe piezometer		SURFACE ELEVATION 286.05 ft (NAVD88)
DRILLING METHOD AUGER(0'-6.5'), ROTARY(6.5'-151.5')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Piezometer			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
			TOTAL DEPTH OF BORING 151.5 ft		

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
120			Poorly graded SAND with SILT (SP-SM); very dense; brown; wet; fine; little SILT; weak cementation.  121.0', coarser; less fines; trace GRAVEL.	X	S29	120	38-41-50	91	18	9									Silt content may be overestimated fro 120 to end
						121.5													
161.05	125		SILTY SAND (SM); very dense; grayish brown; wet; fine; interbedded SAND and SILT; some fines; weak cementation.	X	S30	125	20-27-38	65	18	14									
						126.2					73								
156.05	130		SILTY SAND (SM); very dense; yellowish brown; wet; fine; trace fines; weak cementation.	X	S31	130	14-33-50	83/ 11"	17	13									
						131.2													
151.05	135		SILTY SAND (SM); very dense; yellowish brown; wet; fine; some SILT; weak cementation.	X	S32	135	24-25-26	51	18	16									
						136.5					65								
146.05	140																		

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0013AR</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>7 of 8</b>	



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>	
LOGGED BY A. Poling	BEGIN DATE Oct-19-11	COMPLETION DATE Oct-20-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2146714.433 / E6332311.651 (National Grid)	
DRILLING CONTRACTOR/DRILLER Pitcher/W. Baker			IN-SITU TESTING Standpipe piezometer	
DRILLING METHOD AUGER(0'-6.5'), ROTARY(6.5'-151.5')			DRILL RIG Failing 1500	
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop	
BOREHOLE BACKFILL AND COMPLETION Piezometer			TOTAL DEPTH OF BORING 151.5 ft	
			DURING DRILLING Not Recorded	
			AFTER DRILLING (DATE) Not Recorded	

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
140			interbedded SAND and SILT.		S33	140	19-22-37	59	18	16									
						141.5													
141.05	145		SANDY SILT (ML); hard; grayish brown; wet; some SAND; low cementation.		S34	145	22-24-35	59	18	13									
						146.5													
136.05	150		SILTY SAND (SM); very dense; grayish brown; wet; fine; little fines; low cementation.		S35	150	20-24-32	56	18	17									
						151.5													
131.05	155		Borehole terminated at a depth of 151.5' on 10/20/2011. Piezometer installed.																
			For corrosion test results, see Appendix E.																
			Soil moisture indicated as "wet" because SPT samples became wet during retrieval through rotary method drilling fluid. Soil moisture indication should not be used as an indication of a potential phreatic surface or free groundwater table.																
			See Borehole Log Legend for soil classification chart and key to test data and sampler type.																
126.05	160																		



REPORT TITLE BORING RECORD				HOLE ID S0013AR
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME California High-Speed Train				
BRIDGE NUMBER		PREPARED BY D. Maggi/T. Curran	DATE 2-20-12	SHEET 8 of 8

PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY N. Goodenow	BEGIN DATE Oct-20-11	COMPLETION DATE Oct-21-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2143960.181 / E6334723.77 (National Grid)		HOLE ID <b>S0014AR</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. McMacken			IN-SITU TESTING		SURFACE ELEVATION 285.42 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-81.5')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 3.75 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 81.5 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests
	0		ASPHALT (7") (AC).	S01	0			60	60								
			AGGREGATE BASE (9") (AB).														
			SANDY SILT (ML); stiff; brown; moist; [ALLUVIUM].							67.7							
	5			S02	5	5-6-6	12	18	18								
					6.5					53.5	17.4						
			SILTY SAND (SM); medium dense; grayish brown with brown mottling; moist; some SILT; rapid dilatancy.	S03	6.5	7-9-7	16	18	16								
					8					40.9	14.9						
				S04	8	6-8-9	17	18	15								
					9.5					44.4	16			1.9			
	10		SANDY CLAY (CL); stiff; brown with white seams; some fine SAND; few SILT; slow dilatancy; weak cementation.	S05	9.5	4-6-7	13	18	18								
					11					59.1	21.3	27	10				
			SILTY SAND (SM); medium dense; brown; little SILT; rapid dilatancy.	S06	11	5-8-9	17	18	14								S06 and S07 contains pinkish red contaminant along seams and partings
					12.5					29.7	14.9						
			SANDY CLAY (CL); very stiff; brown; some SAND.	S07	12.5	6-8-10	18	18	16								
					14					58.9	21.4	65	49	3.4			
			SILTY SAND (SM); medium dense; brown; wet; little SILT; rapid dilatancy.	S08	14	7-11-12	23	18	15								S08 contains the contaminant throughout sample Silt lens from 14.3' - 14.5' and 14.6' - 14.8'
					15.5					21.6							

(continued)

REPORT TITLE BORING RECORD				HOLE ID S0014AR	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME California High-Speed Train					
BRIDGE NUMBER		PREPARED BY D. Maggi/T. Curran		DATE 2-20-12	SHEET 1 of 5



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY N. Goodenow	BEGIN DATE Oct-20-11	COMPLETION DATE Oct-21-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2143960.181 / E6334723.77 (National Grid)		HOLE ID <b>S0014AR</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. McMacken			IN-SITU TESTING		SURFACE ELEVATION 285.42 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-81.5')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 3.75 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 81.5 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
260.42	20				S09	20	6-9-10	19	18	15									
						21.5					43.8	8.2							
255.42	25		25.0', grades dense.		S10	25	10-17-15	32	18	14									
						26.5					25.3								
250.42	30		SAND with SILT (SP-SM); medium dense; reddish brown; wet; medium SAND; rapid dilatancy.		S11	30	9-12-14	26	18	14									
						31.5					6	12.3							
245.42	35		SILTY SAND (SM); very dense; reddish brown; medium SAND; some SILT; rapid dilatancy; weak cementation.		S12	35	56-18-18	36	18	18									
						36.5					33.9	12							

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0014AR</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>2 of 5</b>	



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY N. Goodenow	BEGIN DATE Oct-20-11	COMPLETION DATE Oct-21-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2143960.181 / E6334723.77 (National Grid)		HOLE ID <b>S0014AR</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. McMacken			IN-SITU TESTING		SURFACE ELEVATION 285.42 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-81.5')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 3.75 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 81.5 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	40		SANDY CLAY (CL); hard; reddish brown; some fine SAND; medium plasticity; slow dilatancy.		S13	40	11-19-31	50	18	17									
						41.5					60.8	16.9	30	19					
240.42	45				S14	45	14-16-21	37	18	18									
						46.5					55.2	16.4	28	17					
235.42	50		SILTY SAND (SM); dense; reddish brown; with iron oxide staining.		S15	50	7-18-20	38	18	17									
						51.5					42.1	19.3							
230.42	55		55.0', grades very dense; trace fine gravel.		S16	55	14-25-36	61	18	15									
						56.5													Gravel experienced from 55.0' - 55.6'
225.42	60																		

(continued)

REPORT TITLE BORING RECORD				HOLE ID S0014AR	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME California High-Speed Train					
BRIDGE NUMBER		PREPARED BY D. Maggi/T. Curran		DATE 2-20-12	SHEET 3 of 5



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY N. Goodenow	BEGIN DATE Oct-20-11	COMPLETION DATE Oct-21-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2143960.181 / E6334723.77 (National Grid)		HOLE ID <b>S0014AR</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. McMacken			IN-SITU TESTING		SURFACE ELEVATION 285.42 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-81.5')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 3.75 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 81.5 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
60			SANDY SILT (ML); hard; reddish brown with gray mottling; some fine SAND; no dilatancy; weak cementation.		S17	60	17-26-36	62	18	18	65.6	24.2							
						61.5													
220.42	65		SILTY SAND (SM); very dense; reddish brown with gray mottling; some SILT; weak cementation.		S18	65	22-30-30	60	18	18	37.1								
						61.5													
215.42	70				S19	70	19-28-37	65	18	17	49.8	14.9							
						71.5													
210.42	75		SANDY SILT (ML); hard; red and grayish brown; some medium SAND; trace subrounded GRAVEL; slow dilatancy.		S20	75	16-21-20	41	18	18	58.5	22.7							
						76.5													
205.42	80																		

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0014AR</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>4 of 5</b>	





PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY N. Goodenow	BEGIN DATE Oct-20-11	COMPLETION DATE Oct-21-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2143960.181 / E6334723.77 (National Grid)		HOLE ID <b>S0014AR</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. McMacken			IN-SITU TESTING		SURFACE ELEVATION 285.42 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-81.5')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 3.75 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 81.5 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
80					S21	80	26-37-39	76	18	16									1/4 inch thick laminations from 80.0' - 80.5'
						81.5													
			<p>Borehole terminated at a depth of 81.5' on 10/21/2011. Conducted SPT Sampling on 5 foot intervals with the exception of continuous sampling from 5.0 to 15.5 feet. Mud Rotary was used to create a 3 3/4 inch hole using a claw drag bit. The borehole was backfilled using neat cement grout to the satisfaction of the City of Fresno grouting inspector.</p> <p>For corrosion test results, see Appendix E.</p> <p>Soil moisture indicated as "wet" because SPT samples became wet during retrieval through rotary method drilling fluid. Soil moisture indication should not be used as an indication of a potential phreatic surface or free groundwater table.</p> <p>See Borehole Log Legend for soil classification chart and key to test data and sampler type.</p>																
200.42	85																		
195.42	90																		
190.42	95																		
185.42	100																		



REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0014AR</b>	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>					
BRIDGE NUMBER		PREPARED BY <b>D. Maggi/T. Curran</b>		DATE <b>2-20-12</b>	SHEET <b>5 of 5</b>

PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY N. Goodenow	BEGIN DATE Oct-20-11	COMPLETION DATE Oct-20-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2145253.122 / E6333704.642 (National Grid)		HOLE ID <b>S0014R</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. McMacken			IN-SITU TESTING		SURFACE ELEVATION 284.57 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-81.5')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 3.75 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 81.5 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	0		ASPHALT (7") (AC).		S01	0			60	60									
			AGGREGATE BASE (9") (AB).																
			SANDY SILT (ML); brown; moist; some medium SAND; trace GRAVEL; [ALLUVIUM].								53.7								
						5													
279.57	5		SILTY SAND (SM); loose; grayish brown with reddish brown mottling; moist; mostly fine SAND; little fines; rapid dilatancy.		S02	5	3-3-3	6	18	18									
						6.5					17.5	7.5							
			6.5', grades very dense.		S03	6.5	3-7-36	43	18	16									
						8					21.5	11.1							
			SANDY SILTY CLAY (CL-ML); hard; brown with white seams; moist; some fine SAND; little SILT; slow dilatancy; weak cementation.		S04	8	30-22-23	45	18	16									
						9.5					53.9	19.9	21	5					
274.57	10		SILTY SAND (SM); loose; brown with white seams; mostly fine SAND; some fines; slow dilatancy; weak cementation.		S05	9.5	4-3-5	8	18	15									
						11					47.2	16.5							
			Trace GRAVEL.																
			CLAY with SAND (CL); stiff; grayish brown; little fine SAND.		S06	11	3-4-6	10	18	15									
						12.5					70.6	19.3	28	12					
						15					15	19.3							
			SANDY SILT (ML); very stiff; grayish brown; wet; low toughness.		S07	12.5	5-10-13	23	18	17									
						14					59	20.1							
					S08	14	7-11-13	24	18	14									
						15.5					60.2								

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0014R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>1 of 5</b>	



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY N. Goodenow	BEGIN DATE Oct-20-11	COMPLETION DATE Oct-20-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2145253.122 / E6333704.642 (National Grid)		HOLE ID <b>S0014R</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. McMacken			IN-SITU TESTING		SURFACE ELEVATION 284.57 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-81.5')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 3.75 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 81.5 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests
	20		SILTY SAND (SM); medium dense; brownish gray; wet; some SILT; slow dilatancy.	S09	20	9-9-10	19	18	14								
					21.5												
259.57	25		SILTY SAND (SM); medium dense; brownish gray; wet; subrounded; some SILT; rapid dilatancy.	S10	25	8-12-15	27	18	17								
					26.5					43.9	12.6						
254.57	30		Poorly graded SAND (SP); medium dense; reddish brown; wet; medium; some fine SAND; trace fines.	S11	30	6-7-9	16	18	14								
					31.5												
249.57	35		SANDY CLAY (CL); hard; reddish brown; wet; some medium SAND; low plasticity; high dry strength.	S12	35	13-17-22	39	18	18								
					36.5					60.5		27	12				PP: 4.5 tsf TV: 2.5 tsf
244.57	40																

(continued)

REPORT TITLE BORING RECORD				HOLE ID S0014R	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME California High-Speed Train					
BRIDGE NUMBER		PREPARED BY D. Maggi/T. Curran		DATE 2-20-12	SHEET 2 of 5



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY N. Goodenow	BEGIN DATE Oct-20-11	COMPLETION DATE Oct-20-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2145253.122 / E6333704.642 (National Grid)		HOLE ID <b>S0014R</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. McMacken			IN-SITU TESTING		SURFACE ELEVATION 284.57 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-81.5')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 3.75 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 81.5 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	40		SILTY SAND (SM); medium dense; reddish brown; wet; some CLAY; medium plasticity; slow dilatancy.		S13	40	5-4-7	11	18	17									
						41.5					47.9	22.7							
239.57	45		45.0', increasing fines content.		S14	45	4-6-8	14	18	17									
						46.5					49.4		28	17					
234.57	50		SANDY SILT (ML); hard; slightly mottled reddish brown oxidized staining; wet; some fine SAND; weak cementation.		S15	50	16-25-26	51	18	18									
						51.5					59.5	33.5	33	2					
229.57	55		SILTY CLAY with SAND (CL-ML); hard; brownish gray; wet; little fine SAND.		S16	55	12-20-47	67	18	17									
						56.5					75.1	29.4	27	5					
224.57	60																		

(continued)

REPORT TITLE BORING RECORD				HOLE ID S0014R	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME California High-Speed Train					
BRIDGE NUMBER		PREPARED BY D. Maggi/T. Curran		DATE 2-20-12	SHEET 3 of 5



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY N. Goodenow	BEGIN DATE Oct-20-11	COMPLETION DATE Oct-20-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2145253.122 / E6333704.642 (National Grid)		HOLE ID <b>S0014R</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. McMacken			IN-SITU TESTING		SURFACE ELEVATION 284.57 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-81.5')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 3.75 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 81.5 ft





Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
60			SAND with SILT (SP-SM); dense; brownish gray; wet; few SILT; rapid dilatancy.	X	S17	60	13-16-19	35	18	14	11.1								
						61.5													
219.57	65		SILTY SAND (SM); dense; mottled reddish brown; wet; some fines.	X	S18	65	11-19-24	43	18	15	37.8								
						66.5													
214.57	70		70.0', grades very dense.	X	S19	70	16-29-38	67	18	17									
						71.5													
209.57	75		75.0', grades mottled red with grayish brown.	X	S20	75	10-39-50	89/9"	15	15									
						76.5													
204.57	80																		Reached refusal at 50 blow counts; 3.25" left to drive

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0014R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>4 of 5</b>	



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>			
LOGGED BY N. Goodenow		BEGIN DATE Oct-20-11	COMPLETION DATE Oct-20-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2145253.122 / E6333704.642 (National Grid)		HOLE ID <b>S0014R</b>	
DRILLING CONTRACTOR/DRILLER Gregg/D. McMacken				IN-SITU TESTING		SURFACE ELEVATION 284.57 ft (NAVD88)	
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-81.5')				DRILL RIG Mobil B-80		BOREHOLE DIAMETER 3.75 in	
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")				SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%	
BOREHOLE BACKFILL AND COMPLETION Neat cement grout				GROUNDWATER DURING DRILLING READINGS Not Recorded		AFTER DRILLING (DATE) Not Recorded	
						TOTAL DEPTH OF BORING 81.5 ft	

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests	
	80				S21	80	27-50-90	140	18	18										Possible hematite staining
			Borehole terminated at a depth of 81.5' on 10/20/2011.																	
			For corrosion test results, see Appendix E.																	
			Soil moisture indicated as "wet" because SPT samples became wet during retrieval through rotary method drilling fluid. Soil moisture indication should not be used as an indication of a potential phreatic surface or free groundwater table.																	
			See Borehole Log Legend for soil classification chart and key to test data and sampler type.																	
199.57	85																			

1.0.3 BOREHOLE LOG - CHSTP F-B CHSR F-B.GPJ ARUP DOTR LIBRARY.GLB 2/20/12



REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0014R</b>	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>					
BRIDGE NUMBER		PREPARED BY <b>D. Maggi/T. Curran</b>		DATE <b>2-20-12</b>	SHEET <b>5 of 5</b>

PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY A. Poling	BEGIN DATE Oct-18-11	COMPLETION DATE Oct-18-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2141424.139 / E6337011.693 (National Grid)		HOLE ID <b>S0015R</b>
DRILLING CONTRACTOR/DRILLER Pitcher/W. Baker			IN-SITU TESTING		SURFACE ELEVATION 286.65 ft (NAVD88)
DRILLING METHOD AUGER(0'-6.5'), ROTARY(6.5'-51.5')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 51.5 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method Casing Depth	Remarks/ Other Tests
	0		SILTY SAND (SM); reddish brown; dry; fine to medium SAND; some fines; weak cementation; [FILL].	S01	0			60	60								2" of asphalt Bulk sample taken in bucket
					5					34.5							Modified Proctor: Max $\gamma_d = 130.3$ pcf Optimum $W_L = 8.2\%$
281.65	5		5.0', grades very dense; decreasing fines content.	S02	5	1-19-30	49	18	18								
					6.5					20.9	7						
			Poorly graded SAND (SP); dense; light reddish brown; moist to dry; fine to medium SAND; trace SILT; weak cementation; [ALLUVIUM].	S03	6.5	33-32-19	51	18	9	16.7	14.3						Mud tub set at 6.5'
			Poorly graded SAND with SILT (SP-SM); very dense; light yellowish brown; wet; fine to medium SAND; few fines; trace to medium coarse SAND; weak cementation.	S04	8	8-12-15	27	18	17								
					9.5					33.9	19.7						
276.65	10		SILTY SAND (SM); medium dense; brown; wet; fine to medium SAND; some fines; trace medium coarse SAND; weak cementation.	S05	9.5	9-11-16	27	18	18								
					11					31.6							
			SANDY SILT (ML); hard; light brown with reddish brown mottling; wet; fines; some fine to medium SAND; trace medium coarse SAND; weak cementation.	S06	11	20-21-23	44	18	16								
					12.5					56.9	19.9						
			SILTY CLAY with SAND (CL-ML); hard; light brown; wet; little SAND; weak cementation.	S07	12.5	15-14-16	30	18	15								
					14					72.5		24	4				
271.65	15			S08	14	10-18-24	42	18	12								
					15.5					75.7	21.7	23	5				

(continued)

REPORT TITLE BORING RECORD				HOLE ID S0015R	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME California High-Speed Train					
BRIDGE NUMBER		PREPARED BY D. Maggi/T. Curran		DATE 2-20-12	SHEET 1 of 3





PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY A. Poling	BEGIN DATE Oct-18-11	COMPLETION DATE Oct-18-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2141424.139 / E6337011.693 (National Grid)		HOLE ID <b>S0015R</b>
DRILLING CONTRACTOR/DRILLER Pitcher/W. Baker			IN-SITU TESTING		SURFACE ELEVATION 286.65 ft (NAVD88)
DRILLING METHOD AUGER(0'-6.5'), ROTARY(6.5'-51.5')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 51.5 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	20		SILTY SAND (SM); dense; light brown; fine to medium SAND; some fines; weak cementation.		S09	20	12-18-26	44	18	15	44.3	15.6							20.0', switch to 4" bit
			Poorly graded SAND (SP); dense; light brown; wet; trace SILT; fine to medium SAND; trace medium coarse SAND; weak cementation.			21.5													
261.65	25		SILTY SAND (SM); dense; light brown with reddish brown mottling; wet; fine SAND; some fines; weak cementation.		S10	25	11-15-16	31	18	18									
			26.0', grades to fine medium SAND.			26.5					30.8	22.1							
256.65	30		Poorly graded SAND with SILT (SP-SM); dense; light brown with reddish brown mottling; wet; mostly fine to medium SAND; few fines; weak cementation.		S11	30	10-17-23	40	18	12	6.5	21.2							
			SILT (ML); hard; grayish brown; wet; few fine SAND; trace medium SAND; weak cementation.			31.5					85.5								
251.65	35		Poorly graded SAND with SILT (SP-SM); dense; grayish brown with red mottling; wet; fine SAND; few fines; weak cementation.		S12	35	21-21-24	45	18	16									
			SANDY SILT (ML); hard; reddish brown; wet; fines; some fine SAND; weak cementation.			36.5					56.4	17.5							

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0015R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>2 of 3</b>	





PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY A. Poling	BEGIN DATE Oct-18-11	COMPLETION DATE Oct-18-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2141424.139 / E6337011.693 (National Grid)		HOLE ID <b>S0015R</b>
DRILLING CONTRACTOR/DRILLER Pitcher/W. Baker			IN-SITU TESTING		SURFACE ELEVATION 286.65 ft (NAVD88)
DRILLING METHOD AUGER(0'-6.5'), ROTARY(6.5'-51.5')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 51.5 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	40		SILTY SAND (SM); dense; reddish brown; wet; fine SAND; some SILT; weak cementation.		S13	40	14-14-16	30	18	14									
						41.5					49.8	17.5							
241.65	45		45.0', grades to very dense.		S14	45	16-32-35	67	18	16									
						46.5													
236.65	50		SILTY CLAY (CL-ML); hard; grayish brown with reddish brown mottling; wet; trace fine SAND; weak cementation.		S15	50	20-26-29	55	18	17									
			Poorly graded SAND (SP); very dense; light reddish brown; wet; fine SAND; few SILT; weak cementation.			51.5					91.9		25	4					
			Borehole terminated at a depth of 51.5' on 10/18/2011.																
			For corrosion test results, see Appendix E.																
			Soil moisture indicated as "wet" because SPT samples became wet during retrieval through rotary method drilling fluid. Soil moisture indication should not be used as an indication of a potential phreatic surface or free groundwater table.																
231.65	55		See Borehole Log Legend for soil classification chart and key to test data and sampler type.																
226.65	60																		

1.0.3 BOREHOLE LOG - CHSTP F-B CHSR F-B.GPJ ARUP DOTR LIBRARY.GLB 2/20/12



REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0015R</b>	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>					
BRIDGE NUMBER		PREPARED BY <b>D. Maggi/T. Curran</b>		DATE <b>2-20-12</b>	SHEET <b>3 of 3</b>

PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY N. Goodenow	BEGIN DATE Oct-26-11	COMPLETION DATE Oct-27-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2138779.582 / E6338686.271 (National Grid)		HOLE ID <b>S0016R</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. McMacken			IN-SITU TESTING		SURFACE ELEVATION 288.82 ft (NAVD88)
DRILLING METHOD ROTARY(0'-160')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 6.25 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Piezometer			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
TOTAL DEPTH OF BORING 160 ft					

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	0		ASHPHALT (5") (AC).		S01	0			60	60									
			AGGREGATE BASE (5") (AB).																
			SANDY SILT (ML); brown; moist; subrounded; some fine SAND; trace GRAVEL; rapid dilatancy; [ALLUVIUM].								61.1								
283.82	5		5.0', grades grayish brown; wet.		S02	5			18	18	62.5	11.8	19	3					
						10													
278.82	10		SILTY SAND (SM); dense; grayish brown; wet; medium; subrounded; some SILT; slow dilatancy; oxidation seams.		S03	10	12-15-16	31	18	16	30	11.9							
						11.5													
273.82	15		15.0', grades medium dense; brown; little SILT; oxidation seams.		S04	15	6-6-8	14	18	16	24.4								
						16.5													
268.82	20																		

(continued)

REPORT TITLE BORING RECORD				HOLE ID S0016R	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME California High-Speed Train					
BRIDGE NUMBER		PREPARED BY D. Maggi/T. Curran		DATE 2-20-12	SHEET 1 of 9



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY N. Goodenow	BEGIN DATE Oct-26-11	COMPLETION DATE Oct-27-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2138779.582 / E6338686.271 (National Grid)		HOLE ID <b>S0016R</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. McMacken			IN-SITU TESTING		SURFACE ELEVATION 288.82 ft (NAVD88)
DRILLING METHOD ROTARY(0'-160')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 6.25 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Piezometer			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 160 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	20		20.0', grades very dense; reddish brown; some SILT; oxidation staining.		S05	20	28-36-23	59	18	16									
						21.5					36.5	11.7							
263.82	25		Poorly graded SAND with SILT (SP-SM); medium dense; brownish gray; wet; medium; subrounded; few SILT; rapid dilatancy; mostly quartz.		S06	25	9-11-16	27	18	13									
						26.5					6.1								
258.82	30		30.0', oxidation partings.		S07	30	8-11-9	20	18	12									
						31.5													
253.82	35				S08	35	8-10-12	22	18	13									
						36.5					7.1	15.2							
248.82	40																		

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0016R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>2 of 9</b>	



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY N. Goodenow	BEGIN DATE Oct-26-11	COMPLETION DATE Oct-27-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2138779.582 / E6338686.271 (National Grid)		HOLE ID <b>S0016R</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. McMacken			IN-SITU TESTING		SURFACE ELEVATION 288.82 ft (NAVD88)
DRILLING METHOD ROTARY(0'-160')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 6.25 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Piezometer			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 160 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	40		40.0', trace partings of black mafic minerals in the bottom 2 inches of the sample.		S09	40	6-7-12	19	18	11	14.4								
						41.5													
243.82	45		SILTY SAND (SM); dense; reddish brown; wet; subrounded; medium little SILT; black mafic mineral partings.		S10	45	16-15-19	34	18	15	17.9								
						46.5													
238.82	50		SANDY SILTY CLAY (CL-ML); very stiff; grayish brown; wet; little SAND; low plasticity; high dry strength; medium toughness.		S11	50	10-11-15	26	18	18	37.6	15.3							
			CLAY with SAND (CL); very stiff; grayish brown; wet; little SAND; medium plasticity; high dry strength; medium toughness.			51.5					73.3	23.7	30	14					
233.82	55		SILTY SAND (SM); very dense; reddish brown; wet; fine to medium; some SILT.		S12	55	12-20-30	50	18	13	33.3	13.5							
						56.5													
228.82	60																		

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0016R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>3 of 9</b>	



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY N. Goodenow	BEGIN DATE Oct-26-11	COMPLETION DATE Oct-27-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2138779.582 / E6338686.271 (National Grid)		HOLE ID <b>S0016R</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. McMacken			IN-SITU TESTING		SURFACE ELEVATION 288.82 ft (NAVD88)
DRILLING METHOD ROTARY(0'-160')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 6.25 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Piezometer			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 160 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	60				S13	60	19-28-32	60	18	18									
						61.5					42.7	14.9							
223.82	65		Poorly graded SAND with SILT (SP-SM); dense; brownish gray; wet; medium; subrounded; few SILT; oxidized partings.		S14	65	12-14-16	30	18	11									
						66.5					9	15.5							
218.82	70		SANDY SILT (ML); hard; brownish gray to reddish brown; wet; some fine SAND; weak cementation; two distinct calcite seams 1/2 inch thick.		S15	70	14-29-69	98	18	18									
						71.5					52.7	20							
213.82	75		75.0', grades very stiff; grayish brown; little SAND; trace GRAVEL; low plasticity; slow dilatancy; no cementation.		S16	75	5-12-18	30	18	15									
						76.5					64.4	24.9	22	2					
208.82	80																		

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0016R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>4 of 9</b>	



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY N. Goodenow	BEGIN DATE Oct-26-11	COMPLETION DATE Oct-27-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2138779.582 / E6338686.271 (National Grid)		HOLE ID <b>S0016R</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. McMacken			IN-SITU TESTING		SURFACE ELEVATION 288.82 ft (NAVD88)
DRILLING METHOD ROTARY(0'-160')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 6.25 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Piezometer			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 160 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	80		SILTY SAND (SM); dense; grayish brown; wet; some SILT; weak cementation.		S17	80	9-15-26	41	18	18									
						81.5					46.3	22							
203.82	85		SAND with SILT (SP-SM); dense; grayish brown; wet; few SILT.		S18	85	16-19-21	40	18	15									
						86.5					10.3								
198.82	90		SILTY SAND (SM); very dense; grayish brown; wet; some SILT.		S19	90	21-30-40	70	18	18									
						91.5					43.7	15.6							
193.82	95		95.0', grades dense; little SILT.		S20	95	12-20-25	45	18	18									
						96.5					26.9	18.7							
188.82	100																		

(continued)

REPORT TITLE BORING RECORD				HOLE ID S0016R	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME California High-Speed Train					
BRIDGE NUMBER		PREPARED BY D. Maggi/T. Curran		DATE 2-20-12	SHEET 5 of 9



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY N. Goodenow	BEGIN DATE Oct-26-11	COMPLETION DATE Oct-27-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2138779.582 / E6338686.271 (National Grid)		HOLE ID <b>S0016R</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. McMacken			IN-SITU TESTING		SURFACE ELEVATION 288.82 ft (NAVD88)
DRILLING METHOD ROTARY(0'-160')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 6.25 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Piezometer			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 160 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
100			Poorly graded SAND (SP-SM); dense; brown; wet; medium to coarse; subrounded; few SILT.		S21	100	16-19-24	43	18	18									
						101.5					12.4	19.7							
183.82	105		105.0', grades medium dense; grayish brown.		S22	105	12-14-15	29	18	12									
						106.5					7.7								
178.82	110		110.0', grades dense; brown.		S23	110	22-14-19	33	18	18									
			SILTY SAND (SM); dense; brown; wet; fine; some SILT.			111.5					12.5								
											44.7	25.9							
173.82	115		SANDY SILT (ML); hard; brown with gray seams; wet; some fine SAND; slow dilatancy.		S24	115	18-30-63	93	18	18									
						116.5					55.3	20.3							
168.82	120																		

(continued)

REPORT TITLE BORING RECORD				HOLE ID S0016R	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME California High-Speed Train					
BRIDGE NUMBER		PREPARED BY D. Maggi/T. Curran		DATE 2-20-12	SHEET 6 of 9



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY N. Goodenow	BEGIN DATE Oct-26-11	COMPLETION DATE Oct-27-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2138779.582 / E6338686.271 (National Grid)		HOLE ID <b>S0016R</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. McMacken			IN-SITU TESTING		SURFACE ELEVATION 288.82 ft (NAVD88)
DRILLING METHOD ROTARY(0'-160')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 6.25 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Piezometer			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 160 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
120			CLAY (CL); hard; olive brown; wet; few SAND; medium plasticity; slow dilatancy.		S25	120	15-26-33	59	18	18									
						121.5					88	32.7	38	15					
163.82	125		SANDY SILT (ML); hard; light olive brown; wet; some fine SAND; trace medium SAND; slow dilatancy.		S26	125	11-14-18	32	18	12									
						126.5					51.6	25.3							
158.82	130		SILTY SAND (SM); dense; light grayish brown; fine to medium; some SILT.  Laminated from 131.0 to 131.6 feet.		S27	130	15-15-24	39	18	18									
						131.5					40.6								
153.82	135		Poorly graded SAND with SILT (SP-SM); dense; light brownish gray; fine SAND; few fines.		S28	135	12-13-17	30	18	16									
						136.5					12.4	33.5							
148.82	140																		

(continued)

REPORT TITLE BORING RECORD				HOLE ID S0016R	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME California High-Speed Train					
BRIDGE NUMBER		PREPARED BY D. Maggi/T. Curran		DATE 2-20-12	SHEET 7 of 9





PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY N. Goodenow	BEGIN DATE Oct-26-11	COMPLETION DATE Oct-27-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2138779.582 / E6338686.271 (National Grid)		HOLE ID <b>S0016R</b>
DRILLING CONTRACTOR/DRILLER Gregg/D. McMacken			IN-SITU TESTING		SURFACE ELEVATION 288.82 ft (NAVD88)
DRILLING METHOD ROTARY(0'-160')			DRILL RIG Mobil B-80		BOREHOLE DIAMETER 6.25 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 88%
BOREHOLE BACKFILL AND COMPLETION Piezometer			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 160 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
140			140.0' grades medium dense; frequent brown seams.		S29	140	12-10-14	24	18	14									
						141.5					9.7	32.7							
143.82	145		Poorly graded SAND (SP); medium dense; light grayish brown; fine; trace fines; rapid dilatancy; frequent brownish red partings; occasional black partings.		S30	145	15-11-16	27	18	17									
						146.5													
138.82	150		SILTY SAND (SM); medium dense; reddish brown to grayish brown; wet; medium; fine little fines; rapid dilatancy; few reddish brown oxidation seams.		S31	150	12-11-14	25	18	18									
						151.5					20.2	30.8							
133.82	155																		
128.82	160																		

(continued)

REPORT TITLE BORING RECORD				HOLE ID S0016R	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME California High-Speed Train					
BRIDGE NUMBER		PREPARED BY D. Maggi/T. Curran		DATE 2-20-12	SHEET 8 of 9





PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY A. Poling	BEGIN DATE Oct-25-11	COMPLETION DATE Oct-27-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2136102.464 / E6340038.382 (National Grid)		HOLE ID <b>S0017R</b>
DRILLING CONTRACTOR/DRILLER Pitcher/W. Stewart			IN-SITU TESTING Standpipe piezometer		SURFACE ELEVATION 290.54 ft (NAVD88)
DRILLING METHOD AUGER(0'-6.5'), ROTARY(6.5'-151.5')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Piezometer			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
			TOTAL DEPTH OF BORING 151.5 ft		

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	0		ASPHALT (4") (AC).		S01	0			60	60									Hand auger to 5.0'
			SILTY SAND (SM); brown; dry; fine to medium; subangular; some SILT; trace GRAVEL; weak cementation; [FILL].								43.3								Modified Proctor: Max $\gamma_d$ = 125.4 pcf Optimum $W_L$ = 7.6%
285.54	5		SANDY SILT (ML); very stiff; grayish brown; moist to dry; some fine SAND; weak cementation; [ALLUVIUM].		S02	5	5-8-8	16	18	12									Set mud tub at 6.5'; 4.875" drag bit
						6.5					64.7								
280.54	10		10' Grades hard; grayish brown to brown; wet; some fine-medium SAND; weak to moderate cementation.		S03	10	50	50/3"	3	1									10.0'; driller notes hard material
						11.5													
275.54	15		SILT with SAND (ML); hard; grayish brown; wet; little SAND; trace medium to coarse SAND; low plasticity; weak cementation.		S04	15	18-17-15	32	18	15									15.0'; wood debris in cuttings
			Poorly graded SAND (SP); dense; grayish brown; wet; fine to medium; trace fines; weak cementation.			16.5					74.3								
270.54	20																		

(continued)

REPORT TITLE BORING RECORD				HOLE ID S0017R	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME California High-Speed Train					
BRIDGE NUMBER		PREPARED BY D. Maggi/T. Curran		DATE 2-20-12	SHEET 1 of 8



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY A. Poling	BEGIN DATE Oct-25-11	COMPLETION DATE Oct-27-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2136102.464 / E6340038.382 (National Grid)		HOLE ID <b>S0017R</b>
DRILLING CONTRACTOR/DRILLER Pitcher/W. Stewart			IN-SITU TESTING Standpipe piezometer		SURFACE ELEVATION 290.54 ft (NAVD88)
DRILLING METHOD AUGER(0'-6.5'), ROTARY(6.5'-151.5')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Piezometer			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
			TOTAL DEPTH OF BORING 151.5 ft		

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	20		SILTY CLAY with SAND (CL-ML); hard; grayish brown; wet; little medium to coarse SAND; weak cementation.	X	S05	20	12-22-37	59	18	14	72.1		21	4					
						21.5													
265.54	25		Poorly graded SAND with SILT (SP-SM); medium dense; grayish brown; wet; fine to medium; few SILT; weak cementation.	X	S06	25	10-13-16	29	18	12	13.5								
						26.5													
260.54	30		30' Grades to medium SAND.	X	S07	30	12-10-15	25	18	16	7.7								
						31.5													
255.54	35		35' Grades brown; fine-medium SAND.	X	S08	35	38-18-8	26	18	8									
						36.5													
250.54	40																		

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0017R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>2 of 8</b>	



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY A. Poling	BEGIN DATE Oct-25-11	COMPLETION DATE Oct-27-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2136102.464 / E6340038.382 (National Grid)		HOLE ID <b>S0017R</b>
DRILLING CONTRACTOR/DRILLER Pitcher/W. Stewart			IN-SITU TESTING Standpipe piezometer		SURFACE ELEVATION 290.54 ft (NAVD88)
DRILLING METHOD AUGER(0'-6.5'), ROTARY(6.5'-151.5')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Piezometer			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 151.5 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
40			SANDY SILT (ML); hard; grayish brown; wet; some fine SAND; low plasticity; weak cementation.	X	S09	40	9-12-18	30	18	8	62.4		22	3					
						41.5													
245.54	45		SILTY SAND (SM); dense; reddish brown; wet; fine to medium; some SILT; trace coarse SAND; weak cementation.	X	S10	45	18-18-23	41	18	12	31.6								
						46.5													
240.54	50		50' Grades very dense; grayish brown with reddish brown mottling; fine.	X	S11	50	50	50/6"	6	6	46.2								
						51.5													
235.54	55		55' Grades to reddish brown; fine to medium; little SILT.	X	S12	55	27-27-27	54	18	8	22.3								
						56.5													
230.54	60																		

(continued)

1.0.3 BOREHOLE LOG - CHSTP F-B CHSR F-B.GPJ ARUP DOTR LIBRARY.GLB 2/20/12



REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0017R</b>	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>					
BRIDGE NUMBER		PREPARED BY <b>D. Maggi/T. Curran</b>		DATE <b>2-20-12</b>	SHEET <b>3 of 8</b>

PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY A. Poling	BEGIN DATE Oct-25-11	COMPLETION DATE Oct-27-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2136102.464 / E6340038.382 (National Grid)		HOLE ID <b>S0017R</b>
DRILLING CONTRACTOR/DRILLER Pitcher/W. Stewart			IN-SITU TESTING Standpipe piezometer		SURFACE ELEVATION 290.54 ft (NAVD88)
DRILLING METHOD AUGER(0'-6.5'), ROTARY(6.5'-151.5')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Piezometer			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 151.5 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
60			60' Grades dense; some fines.	X	S13	60	13-15-17	32	18	14	30.2								
						61.5													
225.54	65		65' Grades very dense; grayish brown; fine to medium.	X	S14	65	25-31-41	72	18	10									
						66.5													
220.54	70		SANDY SILT (ML); hard; grayish brown; wet; some fine SAND; weak cementation.	X	S15	70	17-22-22	44	18	12	61.7								
						71.5													
215.54	75		SILTY SAND (SM); very dense; reddish brown; wet; fine to medium; some SILT; weak cementation.	X	S16	75	30-31-50	81/11"	17	17	45.1								
			75.8' Grades to grayish brown with seams of reddish brown 1/16" to 1/8" long and variegated white.			76.5													
210.54	80																		

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0017R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>4 of 8</b>	



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY A. Poling	BEGIN DATE Oct-25-11	COMPLETION DATE Oct-27-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2136102.464 / E6340038.382 (National Grid)		HOLE ID <b>S0017R</b>
DRILLING CONTRACTOR/DRILLER Pitcher/W. Stewart			IN-SITU TESTING Standpipe piezometer		SURFACE ELEVATION 290.54 ft (NAVD88)
DRILLING METHOD AUGER(0'-6.5'), ROTARY(6.5'-151.5')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Piezometer			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
			TOTAL DEPTH OF BORING 151.5 ft		

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	80		LEAN CLAY (CL); hard; grayish brown; wet; few fine to medium SAND; low plasticity; weak cementation.		S17	80	9-12-19	31	18	18	85.1		27	4					
			SANDY SILT (ML); hard; grayish brown; wet; some fine to medium SAND; weak cementation.			81.5					56								
			80.9', grades to little fine to medium SAND.																
205.54	85		SILTY SAND (SM); dense; grayish brown; wet; fine to medium; little SILT; weak cementation.		S18	85	14-20-25	45	18	15	17.7								
			SANDY SILT (ML); hard; brown; wet; some fine to medium SAND; weak cementation.			86.5					51.7								
200.54	90		SILTY SAND (SM); very dense; reddish brown; wet; fine to coarse; some SILT; weak cementation.		S19	90	37-50	50/ 5.5"	12	12	36.2								
						91.5													
195.54	95		SANDY CLAY (CL); hard; grayish brown with reddish brown layers; wet; some fine to coarse SAND; medium plasticity; weak cementation.		S20	95	34-50	50/ 3"	9	9	59.3								
						96.5													
190.54	100																		

(continued)

REPORT TITLE BORING RECORD				HOLE ID S0017R	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME California High-Speed Train					
BRIDGE NUMBER		PREPARED BY D. Maggi/T. Curran		DATE 2-20-12	SHEET 5 of 8



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY A. Poling	BEGIN DATE Oct-25-11	COMPLETION DATE Oct-27-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2136102.464 / E6340038.382 (National Grid)		HOLE ID <b>S0017R</b>
DRILLING CONTRACTOR/DRILLER Pitcher/W. Stewart			IN-SITU TESTING Standpipe piezometer		SURFACE ELEVATION 290.54 ft (NAVD88)
DRILLING METHOD AUGER(0'-6.5'), ROTARY(6.5'-151.5')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Piezometer			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
			TOTAL DEPTH OF BORING 151.5 ft		

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	100		CLAYEY SAND (SC); very dense; grayish brown; wet; fine to medium; weak cementation.		S21	100	38-50	50/3	12	11	43.1								
						101.5													
185.54	105		SANDY SILT (ML); hard; grayish brown with reddish brown mottling; wet; fine to coarse; weak cementation.		S22	105	17-23-27	50	18	17	58.3								
						106.5													
180.54	110		Poorly graded SAND (SP); dense; brown; wet; medium; trace fines; weak cementation.		S23	110	19-14-20	34	18	17									
						111.5													
175.54	115		SILTY SAND (SM); dense; brown; wet; fine to medium; little SILT; weak cementation.		S24	115	12-24-25	49	18	16	26.4								
			116' Grades fine.			116.5													
170.54	120																		

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0017R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>6 of 8</b>	





PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY A. Poling	BEGIN DATE Oct-25-11	COMPLETION DATE Oct-27-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2136102.464 / E6340038.382 (National Grid)		HOLE ID <b>S0017R</b>
DRILLING CONTRACTOR/DRILLER Pitcher/W. Stewart			IN-SITU TESTING Standpipe piezometer		SURFACE ELEVATION 290.54 ft (NAVD88)
DRILLING METHOD AUGER(0'-6.5'), ROTARY(6.5'-151.5')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Piezometer			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 151.5 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
120			CLAY with SAND (CL); hard; brown; wet; few fine SAND; trace medium SAND; medium plasticity; weak cementation.	X	S25	120	17-50	50/ 8"	12	12									
						121.5					76.4		27	10					
165.54	125		Poorly graded SAND (SP); dense; brown; wet; fine to medium; trace fines; weak cementation. 125.4' Grades to grayish brown.	X	S26	125	16-22-23	45	18	10									
						126.5													
160.54	130		130' Grades medium.	X	S27	130	20-20-27	47	18	9									
						131.5													
155.54	135		135' Grades very dense; fine. 135.5' Grades to medium.	X	S28	135	25-30-38	68	18	9									
						136.5													

(continued)

REPORT TITLE BORING RECORD				HOLE ID S0017R	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME California High-Speed Train					
BRIDGE NUMBER		PREPARED BY D. Maggi/T. Curran		DATE 2-20-12	SHEET 7 of 8



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY A. Poling	BEGIN DATE Oct-25-11	COMPLETION DATE Oct-27-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2136102.464 / E6340038.382 (National Grid)		HOLE ID <b>S0017R</b>
DRILLING CONTRACTOR/DRILLER Pitcher/W. Stewart			IN-SITU TESTING Standpipe piezometer		SURFACE ELEVATION 290.54 ft (NAVD88)
DRILLING METHOD AUGER(0'-6.5'), ROTARY(6.5'-151.5')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Piezometer			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 151.5 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
140			SILT with SAND (ML); hard; brown; wet; little fine to medium SAND; medium plasticity; weak cementation.		S29	140	18-16-17	33	18	18	70.9		40	14					
			Poorly graded SAND (SP); dense; brown; wet; fine to medium; trace fines; weak cementation.			141.5													
145.54	145		Poorly graded SAND with SILT (SP-SM); dense; brown; wet; fine to medium; few SILT; weak cementation. 144.5', grades to coarse.		S30	145	14-18-23	41	18	12	73.3								
			SILT with SAND (ML); hard; brown; wet; few fine to medium SAND; weak cementation.			146.5													
140.54	150		SANDY SILT (ML); hard; grayish brown with brown mottling; wet; some fine SAND; weak cementation.		S31	150	13-27-25	52	18	18	58.9								
						151.5													
Borehole terminated at a depth of 151.5' on 10/27/2011.																			
For corrosion test results, see Appendix E.																			
Soil moisture indicated as "wet" because SPT samples became wet during retrieval through rotary method drilling fluid. Soil moisture indication should not be used as an indication of a potential phreatic surface or free groundwater table.																			
See Borehole Log Legend for soil classification chart and key to test data and sampler type.																			

1.0.3 BOREHOLE LOG - CHSTP F-B CHSR F-B.GPJ ARUP DOTR LIBRARY.GLB 2/20/12



REPORT TITLE BORING RECORD				HOLE ID S0017R	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME California High-Speed Train					
BRIDGE NUMBER		PREPARED BY D. Maggi/T. Curran		DATE 2-20-12	SHEET 8 of 8

PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY A. Poling	BEGIN DATE Oct-27-11	COMPLETION DATE Oct-28-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2134428.022 / E6340369.116 (National Grid)		HOLE ID <b>S0018R</b>
DRILLING CONTRACTOR/DRILLER Pitcher/W. Stewart			IN-SITU TESTING Standpipe piezometer		SURFACE ELEVATION 305.75 ft (NAVD88)
DRILLING METHOD AUGER(0'-6.5'), ROTARY(6.5'-165')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
			TOTAL DEPTH OF BORING 165 ft		

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	0		ASPHALT (8") (AC).		S01	0			60	60									
			SILTY SAND (SM); brown; moist to dry; fine to medium; trace fines; subangular GRAVEL; weak cementation; [FILL].								40.1								Modified Proctor: Max $\gamma_d = 127.4$ pcf Optimum $W_L = 8.6\%$
300.75	5		SANDY SILTY CLAY (CL-ML); hard; brown with grayish brown mottling; some fine SAND; low plasticity; weak cementation; [ALLUVIUM].		S02	5	12-15-16	31	18	18	54.8	10.1							Mud rotary set up at 6.5'; 4.875" drag bit
						6.5													
295.75	10		SILTY SAND (SM); dense; grayish brown interbedded with reddish brown; some SILT; trace fine GRAVEL.		S03	10	16-23-22	45	18	14	43.5	14.4							
						11.5													
290.75	15				S04	15	19-20-17	37	18	15	48.8	11.8							
						16.5													
285.75	20																		

(continued)

REPORT TITLE BORING RECORD				HOLE ID S0018R	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME California High-Speed Train					
BRIDGE NUMBER		PREPARED BY D. Maggi/T. Curran		DATE 2-20-12	SHEET 1 of 9



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY A. Poling	BEGIN DATE Oct-27-11	COMPLETION DATE Oct-28-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2134428.022 / E6340369.116 (National Grid)		HOLE ID <b>S0018R</b>
DRILLING CONTRACTOR/DRILLER Pitcher/W. Stewart			IN-SITU TESTING Standpipe piezometer		SURFACE ELEVATION 305.75 ft (NAVD88)
DRILLING METHOD AUGER(0'-6.5'), ROTARY(6.5'-165')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 165 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	20		20.0', grades medium dense; brown.		S05	20	4-6-9	15	18	12	38	13.1							
						21.5													
280.75	25		SILTY CLAY with SAND (CL-ML); hard; brown interbedded with grayish brown with reddish brown mottling; wet; little SAND; low plasticity.		S06	25	8-13-18	31	18	14	76.9	24.9	22	4					
						26.5													
275.75	30		SILTY SAND (SM); medium dense; reddish brown; wet; fine to medium; some SILT.		S07	30	10-12-13	25	18	14	25.3								
						31.5													
270.75	35		Poorly graded SAND with SILT (SP-SM); very dense; brown; wet; fine; few SILT.		S08	35	26-27-27	54	18	15	13.4								
			35.6', grades to grayish brown; fine to medium.			36.5													

(continued)

REPORT TITLE BORING RECORD				HOLE ID S0018R	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME California High-Speed Train					
BRIDGE NUMBER		PREPARED BY D. Maggi/T. Curran		DATE 2-20-12	SHEET 2 of 9



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY A. Poling	BEGIN DATE Oct-27-11	COMPLETION DATE Oct-28-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2134428.022 / E6340369.116 (National Grid)		HOLE ID <b>S0018R</b>
DRILLING CONTRACTOR/DRILLER Pitcher/W. Stewart			IN-SITU TESTING Standpipe piezometer		SURFACE ELEVATION 305.75 ft (NAVD88)
DRILLING METHOD AUGER(0'-6.5'), ROTARY(6.5'-165')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 165 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	40		40.0', grades medium dense; few SILT.		S09	40	8-12-13	25	18	13									
						41.5					7.1	18.1							
260.75	45		45.0', grades very dense.		S10	45	18-34-47	81	18	10									
						46.5					9.5	12.4							
255.75	50		SANDY SILT (ML); dense; grayish brown; wet; little fine SAND; weak cementation.		S11	50	13-16-19	35	18	13									
			Poorly graded SAND (SP); dense; grayish brown; wet; fine to medium; trace SILT; weak cementation.			51.5					83.1								
250.75	55		Poorly graded SAND with SILT (SP-SM); dense; grayish brown; wet; fine to medium; few SILT; weak cementation.		S12	55	14-18-19	37	18	8									
						56.5					11.1								
245.75	60																		

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0018R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>3 of 9</b>	



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY A. Poling	BEGIN DATE Oct-27-11	COMPLETION DATE Oct-28-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2134428.022 / E6340369.116 (National Grid)		HOLE ID <b>S0018R</b>
DRILLING CONTRACTOR/DRILLER Pitcher/W. Stewart			IN-SITU TESTING Standpipe piezometer		SURFACE ELEVATION 305.75 ft (NAVD88)
DRILLING METHOD AUGER(0'-6.5'), ROTARY(6.5'-165')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
			TOTAL DEPTH OF BORING 165 ft		

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
60			SILTY SAND (SM); very dense; reddish brown; wet; fine; some SILT; weak cementation.	X	S13	60	29-50	50/ 5.5"	12	9									
						61.5					39	15.1							
240.75	65		Poorly graded SAND with SILT (SP-SM); very dense; grayish brown; wet; fine to medium; few SILT; weak cementation.	X	S14	65	15-22-50	72/ 11.5"	18	8									
						66.5					11.1	12.4							
235.75	70		SILTY SAND (SM); very dense; reddish brown; wet; fine; little SILT; weak cementation.	X	S15	70	20-22-34	56	18	14									
						71.5					22.2	12.9							
230.75	75		75.0', grades dense; brown; fine; some SILT.	X	S16	75	13-17-21	38	18	17									
						76.5					32.9	13.5							
225.75	80																		

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0018R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>4 of 9</b>	



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY A. Poling	BEGIN DATE Oct-27-11	COMPLETION DATE Oct-28-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2134428.022 / E6340369.116 (National Grid)		HOLE ID <b>S0018R</b>
DRILLING CONTRACTOR/DRILLER Pitcher/W. Stewart			IN-SITU TESTING Standpipe piezometer		SURFACE ELEVATION 305.75 ft (NAVD88)
DRILLING METHOD AUGER(0'-6.5'), ROTARY(6.5'-165')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
			TOTAL DEPTH OF BORING 165 ft		

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
80			Poorly graded SAND with SILT (SP-SM); dense; grayish brown; wet; medium; few SILT; weak cementation.		S17	80	18-22-25	47	18	14	9.4	16.7							
						81.5													
220.75	85		SANDY SILT (ML); hard; grayish brown; wet; some fine SAND; weak cementation.		S18	85	21-34-35	69	18	16	53.3	20.4							
						86.5													
215.75	90		SILT with SAND (ML); hard; brown; wet; little fine SAND; weak cementation.		S19	90	19-27-37	64	18	14	84.9	30.2							
			SANDY SILT (ML); hard; brown with reddish brown mottling; wet; some fine SAND; weak cementation.			91.5					69.5	27.1							
210.75	95		SILTY SAND (SM); very dense; brown; wet; fine to medium; little SILT.		S20	95	24-31-43	74	18	12	23.8	13.5							
						96.5													
205.75	100																		

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0018R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>5 of 9</b>	



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY A. Poling	BEGIN DATE Oct-27-11	COMPLETION DATE Oct-28-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2134428.022 / E6340369.116 (National Grid)		HOLE ID <b>S0018R</b>
DRILLING CONTRACTOR/DRILLER Pitcher/W. Stewart			IN-SITU TESTING Standpipe piezometer		SURFACE ELEVATION 305.75 ft (NAVD88)
DRILLING METHOD AUGER(0'-6.5'), ROTARY(6.5'-165')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 165 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
100			100.0', grades trace organic material.	X	S21	100	36-50	50/ 5"	11	11									
						101.5					27.8	16.9			2.1				
200.75	105		105.0', grades fine; some SILT.	X	S22	105	22-25-32	57	18	12									
						106.5					37								
195.75	110		110.0', grades to grayish brown.	X	S23	110	43-37-50	87/ 10.5"	17	14									
						111.5					38.1	17							
190.75	115			X	S24	115	21-27-27	54	18	7									
						116.5													

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0018R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>6 of 9</b>	





PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY A. Poling	BEGIN DATE Oct-27-11	COMPLETION DATE Oct-28-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2134428.022 / E6340369.116 (National Grid)		HOLE ID <b>S0018R</b>
DRILLING CONTRACTOR/DRILLER Pitcher/W. Stewart			IN-SITU TESTING Standpipe piezometer		SURFACE ELEVATION 305.75 ft (NAVD88)
DRILLING METHOD AUGER(0'-6.5'), ROTARY(6.5'-165')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in
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BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 165 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
120			SANDY SILT (ML); hard; grayish brown with reddish brown mottling; wet; some fine SAND; weak cementation.	X	S25	120	8-16-40	56	18	10	57.4								
						121.5													
180.75	125		SILTY SAND (SM); very dense; grayish brown; wet; medium; few SILT; weak cementation.	X	S26	125	23-30-42	72	18	9	16.6								
						126.5													
175.75	130		130' Grades fine. 130.2' Grades fine to medium.	X	S27	130	21-30-40	70	18	11	23.8	21.5							
						131.5													
170.75	135		SANDY SILT (ML); hard; grayish brown; wet; some fine to medium SAND; weak cementation.	X	S28	135	35-50	50/4"	10	10	61.3	19.9							
						136.5													

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0018R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>7 of 9</b>	



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY A. Poling	BEGIN DATE Oct-27-11	COMPLETION DATE Oct-28-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2134428.022 / E6340369.116 (National Grid)		HOLE ID <b>S0018R</b>
DRILLING CONTRACTOR/DRILLER Pitcher/W. Stewart			IN-SITU TESTING Standpipe piezometer		SURFACE ELEVATION 305.75 ft (NAVD88)
DRILLING METHOD AUGER(0'-6.5'), ROTARY(6.5'-165')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
			TOTAL DEPTH OF BORING 165 ft		

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
140			SILTY SAND (SM); dense; brown; wet; fine to medium; some SILT; weak cementation.		S29	140	12-17-21	38	18	16									
						141.5					42.1								
			SILT (ML); hard; grayish brown; wet; few SAND; weak cementation.								85.1								
160.75	145		SILTY SAND (SM); dense; grayish brown; wet; fine; some SILT; weak cementation.		S30	145	14-20-24	44	18	12									
						146.5					49.3	22.1							
155.75	150		150.0', grades fine to medium-fine; little SILT.		S31	150	20-25-28	53	18	12									
						151.5					17.1	23.9							
150.75	155																		
145.75	160																		

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0018R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>8 of 9</b>	



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY A. Poling	BEGIN DATE Oct-27-11	COMPLETION DATE Oct-28-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2134428.022 / E6340369.116 (National Grid)		HOLE ID <b>S0018R</b>
DRILLING CONTRACTOR/DRILLER Pitcher/W. Stewart			IN-SITU TESTING Standpipe piezometer		SURFACE ELEVATION 305.75 ft (NAVD88)
DRILLING METHOD AUGER(0'-6.5'), ROTARY(6.5'-165')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 4.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
			TOTAL DEPTH OF BORING 165 ft		

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
160																			
140.75	165																		
135.75	170																		
130.75	175																		
125.75	180																		

Borehole terminated at a depth of 165.0' on 10/27/2011.

For corrosion test results, see Appendix E.

Soil moisture indicated as "wet" because SPT samples became wet during retrieval through rotary method drilling fluid. Soil moisture indication should not be used as an indication of a potential phreatic surface or free groundwater table.

See Borehole Log Legend for soil classification chart and key to test data and sampler type.



REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0018R</b>	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>					
BRIDGE NUMBER		PREPARED BY <b>D. Maggi/T. Curran</b>		DATE <b>2-20-12</b>	SHEET <b>9 of 9</b>

PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>				PROJECT NUMBER <b>131577-00</b>	
LOGGED BY Trent Cohen	BEGIN DATE Oct-21-11	COMPLETION DATE Oct-21-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2125513.18 / E6341547.865 (National Grid)		HOLE ID <b>S0019R</b>
DRILLING CONTRACTOR/DRILLER Pitcher/W. Baker			IN-SITU TESTING		SURFACE ELEVATION 292.53 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-51.5')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 3.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 51.5 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	0		SILTY SAND (SM); medium dense; light brown; moist; fine; some SILT; weak cementation; [ALLUVIUM].		S01	0			60	60									No asphalt
	5					5					38.3								
287.53					S02	5	4-8-11	19	18	18									
			SANDY SILT (ML); very stiff; gray; moist; some fine SAND; low plasticity; weak to moderate cementation.			6.5					39.5	4.6							
			SILTY SAND (SM); medium dense; brown with gray seams; moist; fine; some SILT; weak cementation.		S03	6.5	9-11-12	23	18	18	64.4			23	2				
						8					43.3	4.5							
			SILTY SAND (ML); medium dense; grayish brown with reddish brown staining; moist; fine; some fines; weak cementation.		S04	8	2-5-7	12	18	12									
			Poorly graded SAND (SP); medium dense; brown with gray seams; wet; fine; trace fines; weak cementation.			9.5													
282.53	10		SILT (ML); stiff; grayish brown with reddish brown staining; wet; few SAND; low plasticity; weak cementation.		S05	9.5	6-6-6	12	18	15	88.1	17.9	23	3					
						11					53.7	25.6							
			SANDY SILT (ML); stiff; brown with reddish brown staining; wet; some fine SAND; weak cementation.		S06	11	4-6-6	12	18	14									
			Poorly graded SAND with SILT (SP-SM); medium dense; brown with reddish brown staining; wet; few SILT; weak cementation; micaceous.			12.5													
					S07	12.5	6-6-6	12	18	15									
						14					11.9								
277.53	15		Poorly graded SAND (SP); loose; grayish brown with dark gray seams; wet; fine to medium; trace fines; weak cementation.		S08	14	4-4-4	8	18	14									
						15.5					2.8	24.1							

(continued)

REPORT TITLE BORING RECORD				HOLE ID S0019R	
DIST.	COUNTY	ROUTE	POSTMILE	EA	
PROJECT OR BRIDGE NAME California High-Speed Train					
BRIDGE NUMBER		PREPARED BY D. Maggi/T. Curran		DATE 2-20-12	SHEET 1 of 3



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY Trent Cohen	BEGIN DATE Oct-21-11	COMPLETION DATE Oct-21-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2125513.18 / E6341547.865 (National Grid)		HOLE ID <b>S0019R</b>
DRILLING CONTRACTOR/DRILLER Pitcher/W. Baker			IN-SITU TESTING		SURFACE ELEVATION 292.53 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-51.5')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 3.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 51.5 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	20		SILTY SAND (SM); medium dense; brown; wet; fine; little SILT; weak cementation.		S09	20	14-11-9	20	18	16									
						21.5					22.3	12.3							
267.53	25		Poorly graded SAND with SILT (SP-SM); medium dense; grayish brown with dark gray seams; wet; fine; trace fines; weak cementation.		S10	25.5	6-8-9	17	18	14									
						27					5	20.5							
262.53	30		Poorly graded SAND with SILT (SP-SM); medium dense; grayish brown with dark gray seams; wet; medium; few SILT; weak cementation. 31.1', 2" layer; light gray; weak to medium cementation.		S11	30	8-10-26	36	18	15									
						31.5					6.3	23.4							
257.53	35		SILT with SAND (ML); hard; brown with reddish brown staining; wet; few fine SAND; weak cementation.		S12	35	19-18-18	36	18	17									
			SILTY SAND (SM); dense; brown with reddish brown staining; wet; fine; some SILT; weak to moderate cementation.			36.5					76.9								
											38.6								
					S13	39	11-15-16	31	18	10									
252.53	40																		

(continued)

REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0019R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>2 of 3</b>	



PROJECT NAME <b>California High-Speed Train Fresno to Bakersfield</b>			PROJECT NUMBER <b>131577-00</b>		
LOGGED BY Trent Cohen	BEGIN DATE Oct-21-11	COMPLETION DATE Oct-21-11	BOREHOLE LOCATION (Lat/Long or North/East and Datum) N2125513.18 / E6341547.865 (National Grid)		HOLE ID <b>S0019R</b>
DRILLING CONTRACTOR/DRILLER Pitcher/W. Baker			IN-SITU TESTING		SURFACE ELEVATION 292.53 ft (NAVD88)
DRILLING METHOD AUGER(0'-5'), ROTARY(5'-51.5')			DRILL RIG Failing 1500		BOREHOLE DIAMETER 3.875 in
SAMPLER TYPE(S) AND SIZE(S) (ID) SPT(1-3/8")			SPT HAMMER TYPE/HAMMER ID Automatic, 140 lbs, 30-inch drop		HAMMER EFFICIENCY, ERI 68%
BOREHOLE BACKFILL AND COMPLETION Neat cement grout			GROUNDWATER READINGS	DURING DRILLING Not Recorded	AFTER DRILLING (DATE) Not Recorded
					TOTAL DEPTH OF BORING 51.5 ft

Elevation (ft)	Depth (ft)	Material Graphics	Description	Sample Location	Sample Number	Sample Depth (ft)	Blows per 6 in.	N-Value (bl/ft)	Penetration (in)	Recovery (in)	200 Wash (%)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Organics (%)	Shear Strength (tsf)	Drilling Method	Casing Depth	Remarks/ Other Tests
	40		SANDY SILT (ML); hard; brown with reddish staining; wet; some fine SAND.			41.5					58.5	23.2							
247.53	45		Poorly graded SAND with SILT (SP-SM); medium dense; grayish brown with reddish brown staining; wet; fine; few SILT; weak cementation.	S14	45	11-12-14	26	18	16		9.3	15.7							
						46.5													
242.53	50		50.0', fine to medium.	S15	50	14-13-16	29	18	15										
						51.5													
Borehole terminated at a depth of 51.5' on 10/21/2011.																			
For corrosion test results, see Appendix E.																			
Soil moisture indicated as "wet" because SPT samples became wet during retrieval through rotary method drilling fluid. Soil moisture indication should not be used as an indication of a potential phreatic surface or free groundwater table.																			
See Borehole Log Legend for soil classification chart and key to test data and sampler type.																			
237.53	55																		
232.53	60																		

1.0.3 BOREHOLE LOG - CHSTP F-B CHSR F-B.GPJ ARUP DOTR LIBRARY.GLB 2/20/12



REPORT TITLE <b>BORING RECORD</b>				HOLE ID <b>S0019R</b>
DIST.	COUNTY	ROUTE	POSTMILE	EA
PROJECT OR BRIDGE NAME <b>California High-Speed Train</b>				
BRIDGE NUMBER	PREPARED BY <b>D. Maggi/T. Curran</b>	DATE <b>2-20-12</b>	SHEET <b>3 of 3</b>	